COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

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Third Quarter

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Mission

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a section of "Foreign Military Digests."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This *Review* is published as a guide to modern military tendencies and to inspire vigorous thoughts on the subjects treated.

The opinions expressed and conclusions drawn in articles are *solely those of the authors and are in no sense official.*

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Acknowledgement

The editors desire to express their thanks and appreciation to those persons who have valuably assisted in the preparation of material for this issue. The work of contributors has been done in addition to their regular duties and gratuitously on their own time. We are very grateful to the following officers for their generous donations:

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MAJOR A. G. TRUDEAU: *Assault of Fortified Positions.*

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The Cover

This picture of General Pershing is from the War Album of "*L'Illustration*".

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The Company Commander

By

Captain Hans Ellenbeck, *German Army*
(*A Company Commander*)

[Condensed from the German book by that name, published by Johannes Detke, K. G. (Kapitalgesellschaft, Joint Stock Company), Leipzig.]

Military leadership is predicated upon cheerful responsibility, superior ability and untiring care.

This article is given first place in this month's Review *because of its excellent portrayal of the role of a Company Commander. Morale, today, is a "headliner" in the news and Captain Ellenbeck's book is chuck-full of it. No officer could possibly read this condensation without deriving a great deal therefrom.—THE EDITOR.*

The Men in the Ranks

The fighting men of the nation are placed in our care. Our task is to train and educate them and make good soldiers of them, and afterwards to lead them in battle. Our comradeship with them must be of the sort that holds good in the face of death itself. A higher position of trust is not conceivable for any man in this nation.

The goal of military training is fitness in combat. This implies that each soldier must be thoroughly familiar with the weapon he is to use, and thoroughly competent to handle it. But soldierly spirit as shown in actual combat, we must remember, is not merely a question of knowledge and skill; it is largely a question of character. Character training and personal influence upon the men in the ranks are of the greatest importance, therefore, especially in time of war. And the men under colors are not all young recruits: many of these men were called in from the reserves; and the "nation under arms" includes not only all social strata, but likewise quite a range of annual contingents. Our task is indeed a comprehensive one.

It still happens quite frequently that soldiers participating in the present war find themselves under the command of an officer considerably younger than they, and perhaps even less experienced in actual combat. All the more it is important that each officer should devote himself enthusiastically to the problems of leadership. All the duties that arise out the obligation of giving personal care to the soldier must be conscientiously performed without fail; and no opportunity should be neglected for establishing bonds of friendly confidence between the officers and their men.

Good leadership presupposes deep insight into the human heart and human relations, and the ability to deal with people.

A soldier must be hardened. Providing for him and taking care of him must not be allowed to soften him, but merely to make it possible for him to undergo cheerfully the inevitable hardships of training and discipline.

A soldier can be counted upon to remain in a state of grace, so to speak, so long as he gets proper care and finds that his officers are providing for him like the best of comrades. The men will follow such leaders through hell and high water, and submit willingly to the hardest duty. But an officer in turn, must be exemplary in his own conduct, in everything he does, in respect of all soldierly virtues. He must never think of himself until he has taken care of his men. Nothing short of the good example will prove convincing. The moral right to make demands upon others is founded exclusively upon living as their example; and only the leader's own achievement can impart to such demands the momemtum of compelling necessity. Setting and following the right example welds officers and men together into an army.

In the hour of danger irresistible strength grows out of such union; and an officer can then place absolute reliance on the men under his command, both when the time has come for reckless daring and at times when even greater courage is required for hours and hours of patient waiting.

It should be obvious enough that profound obligations arise in this manner; and yet these obligations are often neglected, simply because of failure to recognize their importance.

Authority and Discipline

Discipline is the foundation upon which an army is built. A goal of military training should be to inculcate the mere external discipline of the military unit until a point is reached where this discipline is embodied in each individual member of that unit as a fixed mode of living. An officer who in his own person embodies also the subjective type of discipline will be able to attain the goal by making of himself a living example of conduct for his men. His authority will be assured even in the most difficult situations if his sincerity is perfectly obvious, and his men willingly acknowledge him as their leader. It is not really essential for him to be the most intelligent man in his unit, but he must be the most blameless. German soldiers, and especially the ordinary, plain fellows among them, are quite sensitive to the ethical quality of their superiors. They will be only too glad to follow a leader they can look up to and for whom they have genuine respect. Conditions in the field make it necessary for an officer to spend day and night under the scrutiny of his men; and that calls for a high degree of self-discipline, both on and off duty. It implies first of all cheerful and conscientious performance of all necessary tasks; but aside from that the situation also requires cheerful willingness to be content with little in the way of food or lodging, a habit of keeping sober at all times, self-control in matters of sex, avoidance of profligate conversation, as well as a certain steady and calm self-assurance of manner.

As regards social contacts with his comrades, an officer in the field has to meet a situation quite different from that which prevails in times of peace; his friendly entertainment must never be allowed to conflict with any of the necessary restrictions and privations imposed upon the enlisted men; because their desire for company and entertainment is just as great as his own, and not at all less justified.

The burdens, self-denials, restrictions and privations incident to warfare must be borne in common and to an equal share. Every Company Commander needs to cultivate to some extent the old Spartan virtues. His men must be aware that he does not mind doing without one thing and another; that he is above the situation, and that little everyday annoyances will not down him.

An officer's position is exalted above that of his subordinates by virtue of the honor of being permitted to shoulder greater responsibilities and a wider range of duties. The Commanding Officer's uniform obligates him to conduct himself as "the first servant of the unit under his command."

A Commander will not be lacking in natural authority of the sort required for his work if he has genuine native ability and a knack for getting things done, and if while being the chief of his men he is readily regarded by them as "Father of the Company." Where such is the case, there is rarely need for sharp rebuke and compulsion.

Cultivating a Sense of Honor

"A soldier's honor consists in unquestioning devotion of his whole person to the service of his country and nation, and willingness to give his life in that service if necessary."

This exalted conception of military duty must never be disregarded, even in the midst of commonplace daily routine. To make this requirement is indeed to set up a lofty goal for military training and education. Severest discipline and unconditional reliability in great things and small will be found indispensable in achieving it. The importance of the cause at stake is such as to call for prompt and energetic corrective measures, regardless of the identity of the persons involved.

Consequently, it is necessary at times for a Commanding Officer to know how to use strong language. The less it is used, the more effective it will be. But an officer's language on such occasions must always have something wholesome about it at the core. The impression created should be that of righteous manly indignation breaking out in a thunderstorm. And it will be best if the storm does not last too long. The result will be a cleaning of the air; so that the sun is bound to come out again as soon as it's over.

The use of vulgar expressions is unworthy of an officer, and such expressions insult and dishonor the men to whom they are addressed. Using language of that sort can only serve to lessen the men's respect for their officer. The effect will be to embitter the culprit and make him stubborn, instead of restoring good order and reestablishing mutual confidence.

Scolding and nagging can easily become a habit. The results in that case are disastrous, and authority suffers.

If something is wrong, the need is to do something about it promptly, energetically and in a straightforward manner. No one should be allowed to remain in doubt as to the Commander's stand in any matter affecting his relationship to members of his organization, and vice versa. Pettiness and trickery do not befit the character of an officer; and one should not bear grudges and continue to harp on old wrongs.

In administering reproof and correction one should appeal to the offender to compensate somehow for any harm done. Specific suggestions to that end would be quite in order, closing the interview with something of a constructive note.

Rigid self-criticism and a tireless effort to develop one's own powers are standard traits of a real soldier. But the wholesome endeavor constantly to improve upon standards of performance must not be carried to the point of undermining self-confidence by excessive criticism. One can easily produce discouragement instead of an impulse to work ahead with renewed energy. ("What's the use of trying to suit him, anyway!")

Nor should we forget that there are times when praise can be very effective. The suggestion as formulated by Clausewitz is "to praise rarely, but enthusiastically if at all." Approval is called for not only by the conspicuous type of accomplishment; and even a soldier who is assigned to relatively unimportant duties (the company's shoe-repair man, for instance) has a right to feel happy and proud if his captain has occasion now and then to comment favorably on his work.

Every soldier must bear in mind that his honor is comprised in his duties; and that his worth is contingent upon his faithfulness in performing those duties. To give military service for his country and nation is the loftiest duty any human being can perform in this world.

To implant in his men this lofty conception of military honor is one of the outstanding tasks for each Company Commander.

He should be mindful of this task at any time, especially in exercising his punitive authority.

A company commander's authority to determine punishment presupposes a high sense of responsibility as well as willingness to take the initiative.

It is easy enough to impose punishments promptly and frequently. But rare skill is required for a Commander to make punishments a rarity by creating a situation where there is little chance of committing offenses, or even of having the impulse to commit an offense.

Every subordinate must feel thoroughly convinced that his chief will never resort to punishments unless it becomes necessary to do so. Every punishment given should be such that every member of the unit really consents in his heart to that punishment; and the punished man himself must agree that the punishment he has received was just, and a necessary atonement. The effect should be to inspire him with a determination to make up for what he has done. When he reports back for duty, he ought to be shown a way to square himself and then be given every opportunity to do so.

In cases where the Commander feels the slightest doubt about imposing a punishment, he might do well to put the matter off till the next morning. His decision will in each case have to be determined entirely by the exigencies of the situation. If circumstances unquestionably require him to act, it is an irreparable mistake for a Commander to be deterred by any considerations whatever.

Complaints

Complaints can be regarded as an exception. And it is a good thing that such is the case. A soldier, as a rule, will realize perfectly well that he must not attach too much importance to his own person, and that there is no need to call attention to every little thing that happens to go wrong. The situation is not quite the same, however, where a matter of any importance is concerned. But it would be a mistake, and possibly a disastrous mistake, to allow any real grievance to develop without chance of redress.

A soldier, as a rule, does not like to make complaints. He does not like to go to the trouble of appealing through official channels, and would rather avoid the risk of unpleasantness that might arise. Unfortunately it is still customary, when information is issued concerning the right and the procedure of making complaints, to insert quite an unmistakable hint that it is wise not to make use of the privilege.

A Commander who allows any such impression to get out is seriously derelict in his duties, and is acting quite stupidly besides. It is anything but pleasant, certainly, to have to examine a complaint and get unpleasant glimpses of the real functioning of the Company. But it is a fundamental error and unworthy of an officer of the German Army to cut off justified complaints—for the sake of preserving illusions. One must remember that the damage done will only be greater if an evil is allowed to continue, or if at last someone appeals anonymously to higher authority, or to civilian authorities.

A practical matter of decisive importance is that the head of the company must keep himself accessible at all times for any of his men who may wish to talk to him. This is not an easy matter, and very likely the First Sergeant will wish to interpose himself; but no matter how justifiable his motives, he must not be allowed to become an obstacle to personal exchanges between the company commander and his men. The captain himself is the responsible person in all cases of importance, because he alone has ultimate responsibility. In that sense he is the "father" of the company.

Many soldiers, and among them notably some of the best, always will find it hard to make up their mind to approach the commander with a problem of concern to the company as a whole. Consequently, it will be up to him, on special occasions, to make an effort to get such men to speak their mind freely. He needs a faculty for sensing that a man has something of that sort on his mind.

In dealing with problems of this type a commanding officer has every opportunity to prove himself a masterful leader of men. Mere tell-tales and conniving informers ought never be allowed to show their faces. Petty complaints are properly dismissed with a mere wave of the hand. But a sincere and unprejudiced individual who goes to his chief with the idea of helping to promote justice and good order among the armed forces should find in him a sympathetic and helpful adviser.

Advice and Care for the Enlisted Men

The Commander of a Company has a wide field open to him in his effort to meet the broad task of giving advice and care to any of his men who are in difficulty. Aside from the Captain's manifestations of sympathetic interest in the family life of his enlisted men, one might mention under this heading also his efforts to assist them in their correspondence with governmental and other administrative agencies.

The welfare of our soldiers' families has now to a large extent been taken care of, and there is no longer much need of improvement in that respect. But special cases will arise now and then where it becomes necessary to communicate in writing with administrative authorities at home. In peacetime there is no difficulty in taking care of an errand of that sort. The man simply calls at the office concerned; and the whole problem is quickly settled by a brief discussion of doubtful points, on the basis of oral information obtained right then and there. But suppose that in time war the wife finds herself unexpectedly confronted with a difficult situation of one kind or another. She does not know what to do and quickly writes to her husband, telling him as best she can what has happened. But in the army, far away from his home, the husband very likely cannot obtain all of the information required, not to speak of any chance of settling the matter in person. Probably there is not even a place for him to figure the whole thing out for himself in peace and quiet. Suppose the man has received an inquiry from the Treasury or the Office of the Tax Collector, or from his insurance company, or from one of the welfare centers at home. Something will probably have to be done about it. Some cases are bound to require personal attention on the part of the soldier himself. He has been accustomed carefully to look after details of that sort and save his wife all the trouble. He is now away from his home; and we can easily imagine him, sitting in his pillbox or elsewhere in his crowded quarters, studying his wife's letter and worrying about what to do.

Whenever a case like that arises in a properly organized Company, the first thought to come to the man's mind will be: "This is something the C.O. could do for me. He'll be glad to do it!" and if he does take that attitude, there could be no better proof that his chief is well under way towards developing the right sort of relationship with his men.

Nor should the Commander wait for someone to come to him with a request of that sort. During instruction hours he should not only tell his men, again and again, but really mean it: "And now, if any of you have trouble at home, or if there is any kind of letter-writing you need help on . . . I want you to come right straight to me. That's what I am here for. Between the two of us we ought to be able to manage it somehow."

Many cases of that kind can be disposed of by just a short interview to make things clear. A problem that looked very serious at first may seem very much simpler after the Commander has calmly and quietly analyzed the whole situation. Quite often the circumstances will call for a certain amount of correspondence. In that event it will be best for the chief to sit down and dictate to his company clerk whatever letters are needed. For him it is a relatively simple matter to do this correspondence, which for the soldier himself would involve a considerable expense of time and effort. And besides, a properly written letter bearing the Company Commander's signature is not at all unlikely to expedite the business in question.

An officer who puts himself to this slight inconvenience should easily be able to console himself by considering that there is his chance to pay a small fraction of his indebtedness for the good fortune of having been blessed with more comprehensive training at school.

* * * * * * *

Even more important is the Commanding Officer's sympathetic interest in outstanding events effecting the man's family at home, births and deaths especially.

It is always an event of incisive importance to have a gap in the family as a result of death. Usually there have been weeks of worry and care preceding the sad event; and they have been all the harder to bear because the head of the family was away at the front, unable to give such help and advice as he might have been able to contribute. A short telegram at first will probably be all that reaches the soldier with his Company in the field. And even that telegram has been on the way for some time. Hours, often days, have passed since the death; and especially during these first helpless hours the family would have needed its father. Obviously, therefore, a telegram of that sort means a heavy blow to the soldier receiving it; and a message like that should without fail be handed over by the Commanding Officer in person. He simply has to find time for looking after a thing of that sort. So far as possible at all, he must handle a difficult case like that without the presence of witnesses. It would be futile to attempt formulating a method of going about it; at all events there is occasion for every cordiality of manner, and—by way of prompt moral support —for an appeal from man to man for the soldier to keep his military bearing under such grave circumstances. If it is possible at all to grant a leave, one should not wait for the man to make the request, but start him out at once on his way and see to it that he gets hold of the quickest transportation available. And one must not fail to find a few words of sympathy for him to take home with him. A man will hear and remember a kind word spoken to him at such an hour; and he will not fail to deliver the message. A soldier who at one of his life's most bitter moments has had the benefit of such moral support will feel personally attached as long as he lives to the officer who has helped him.

And it is a hard road from the open grave back to the battle front. The Commanding Officer should bear this in mind when the man reports for duty.

Very easy, in comparison, is the task of participating sympathetically in the great joyous events of life. A soldier who has just had a child born to him should be congratulated in the presence of the whole Company; and one should not forget also to write a few words of congratulation to the mother at home.

In all matters of this sort it is up to us officers to show that we really take a personal interest in our men; and we must not try to side-step such duties by saying we haven't the time. Not to have the time to do things is characteristic of small minds!

The Difficult Cases

Each Company has its quota of men who are difficult to deal with: the type commonly referred to as the "difficult cases," such as the type given to pessimism or brooding, the type who are slow to adjust themselves, or the type who are troubled with an inferiority complex. Men like these are the kind most in need of help from their officers.

A fundamentally pessimistic outlook on life is a heavy burden not only for the individual himself but also for those about him. In fighting a war, pessimism is harmful and even dangerous. The best antidote is contact with lively and cheerful companions. The men with a gloomy outlook on life will need speaking to more frequently than others; and usually it is best to address them in something of a humorous vein: the man's negative attitude will be less likely to exert its influence upon others. Often it is possible to get such men to overcome their temperamental handicap. There are instances, to be sure, where a pessimistic outlook on life has fastened itself upon the man's mind as a result of unfortunate experiences. In difficulties of that kind, discussion can often be very helpful. What such men need above all, is the happy experience of living among a group of warm-hearted, friendly comrades. The Company Commander usually can get results by privately asking a sympathetic comrade to look after his fellow soldier.

The brooding type can be dealt with in a similar manner. They should be assigned, if possible, to a section commander who is not overburdened and who is of the spirited kind that will carry the man away with him.

Among the men who are slow to adapt themselves there may be some who are potentially very valuable, but who are in danger of being misunderstood or overlooked entirely. It can easily happen, too, that their slowness is mistaken for indolence, with the result, usually, that the wrong method is chosen in dealing with them. The consequence often is that men of that type will be found to develop an inferiority complex. They ought now and then be given a task that they are really capable of handling well, so as to strengthen their self-confidence. Among the men that a company commander is called upon to deal with are those of the type, too, that have never been able to achieve their inner freedom. And nothing could be better suited than their term of service in the army to strengthen their backbone and make them free. In actual combat the quiet and slow men often show much better qualities than those who did all the talking.

It is an important problem all around to discover men who are more than they seem; and also to find means of severely testing the true quality of those who have a knack for creating a good impression, and to get informers and toadeaters to show their mettle. Zealous clicking of heels often means very little.

Soldiers without family ties are apt to become particularly conscious of their loneliness in times of war. Various methods of helping them are a matter of common knowledge; one only needs to apply them.

Care of the Older Men

As a result of war we find many of our German men wearing the plain uniform of the enlisted man notwithstanding the fact that they are relatively advanced in years and may have substantial accomplishments to their credit in civil life. We must simply take it for granted that they will show willingness to adapt themselves and be content to take in army life the place to which their military experience entitles them. We have university professors, engineers, architects, and highly skilled workmen filling their place in the army as private soldiers or acting corporals; and they

take pride in their opportunity to play a part in events where the very life of their nation is decided by force of arms. The soldier's calling will always be of leading importance so long as healthy nations inhabit the face of this earth. To follow that calling has always been regarded as a very high honor; and that holds true to-day more than ever. It would not be in keeping with German character for a man to expect special acknowledgment for doing his part in that manner. His opportunity to give this service means fulfillment of the fundamental law of his being.

One must bear in mind, none the less, that military service ordinarily entails greater sacrifice for the older men than for young soldiers straight from school. A Company Commander, therefore, should be glad to do what he can to have them regard the necessary duties as an obligation of the sort they will be only to happy to fulfill.

We have in our ranks quite a number of men who are fighting their second war now and who proved their mettle long ago in the first World War. Looking after these men and using them to best advantage must be regarded as a task of special importance.

By finding the right spot for them in his Company the Commander can greatly improve its life as a community: the wide experience of these older men, their greater maturity of mind, their seriousness of attitude, no less than their specific skills and knowledge, constitute values to be turned to account for the benefit of all. Cases will arise quite often where men of this type can be of help to the Commanding Officer in giving care to younger comrades. If capacities latent in the older, experienced soldiers are properly turned to advantage, such men can easily become the nucleus in creating "an indissoluble bond of battle comradeship to unite the troop and its leader."

Cases Where a Request Must be Turned Down

Nor is there any necessity for a Company Commander to give reasons in turning down a request for leave of absence, or any other. When it becomes necessary, as often happens, to turn down a perfectly reasonable request, it is none the less perfectly proper to add a few words of explanation not called for by routine procedure. War is cruel, and its hardships are often extreme. Suppose, for instance, that one of the men desires leave because of serious sickness at home. If such leave cannot be granted, it will probably be best to have the man come in, and to explain to him why it is impossible to let him go. If he can be made to see that his superior officer is tied down by the harsh demands of war, no less than he is, it might be easier for him to renounce his request willingly. He will master his disappointment and gain in self-reliance.

Inspection of Quarters

As soon as his Company is newly billeted in a town or village, the Commanding Officer will inspect the quarters to which his men are assigned. This tour of inspection is one of his regular official duties. In the course of this inspection he will check up on the good order, cleanliness, and appropriateness of the quarters, and at the same time he will remedy objectionable conditions and suggest improvements.

But helpful insights will be yielded especially by a casual tour of inspection later on through the men's quarters and the pillboxes: an unofficial call to be made now and then, unannounced and unaccompanied. On these occasions the Commander does not call in his capacity as the superior officer, but simply as an elder comrade; and his visit will be in the nature of a friendly call, because this time he will be much more at leisure. He will stay for the time of a cigar, sit at the table, with his boys around him, and just let them talk. He will find there are among them some that he never really met before. Take, for instance, the lance-corporal from the Second Platoon, a quiet sort of fellow who never seemed especially bright before; but there he is, deeply absorbed in a chess problem. No one would ever have supposed him to have a reflective turn of mind at all. Muller, the rifleman first class, is one of those men whom the Commander had never noticed before. Now it turns out that he is a marvel at making potato cakes; and the mystery is how anybody could do anything of that sort at all in that kitchen. He reveals himself, moreover, as something of a moving spirit throughout the whole company, anyway: always jolly and always willing to lend a helping hand. Elsewhere, in one of the billets, the Captain finds one of his men all alone, Private X., a fellow with an ever-lastingly sour disposition. Not without difficulty a conversation finally gets under way; and of a sudden the Captain finds out what this man X. is really like. His wife has been laid up almost a year, paralyzed; and she is not expected to live very much longer. No wonder the man had forgotten how to laugh. Going on to the large billet in the barn, he happens to walk in on a man who is just putting on a comic act. The man did not notice his chief coming in and carries on without the slightest embarrasment. Thus a new star is discovered for the next Company entertainment. During one of the Commander's rounds through the quarters even Schulze, a retiring, timid, little soul, finally got up his every ounce of courage and asked for a few words alone with the Captain. And it was interesting to discover, finally, that W., the little acting-corporal from the repair shop, is positively an artist: it was he who drew those sketches along the wall. One word brings on another. He has not had much schooling, but he has done much reading just the same. And quite unexpectedly the C. O. discovers that midnight has come around. For about an hour now he has been talking with Private W., the painter's apprentice, about German art; while the rest of the men looked on with their mouths wide open. It was really a well-spent evening.

The Captain is his Company's father. On his walks through the quarters in the evening he makes the acquaintance of his warrior family.

Remarks on Food for the Company

Food at the Company will be plain, wholesome, and sufficient in quantity. And yet it will be found a matter of great consequence, too, if instead of merely insisting on the usual routine the Company Commander devotes himself intelligently and competently to the very important problem of food for the men.

The cook of a field kitchen is an important personage; because if he knows his business, he can make valuable contributions toward the company's good health and good spirits. A Commanding Officer must make it his business to consult frequently with his cook and with the mess-ser-

geant regarding ways and means of changing the fare, exploiting every opportunity to offer something special.

The cook and his helpers should keep themselves cleaner than any other men in the Company; and there is no such thing as being too tidy in a room where food is kept. By dint of economizing flour and butter one can save enough for a cake once in a while, and that will be a little feast for the whole Company every time. The men will feel they are in good hands if they notice that from time to time their Commander will stop to concern himself with the mess problem, contributing a good suggestion of his own now and then, and helping the cook as best he can. A chief who lives up to these principles will find he can ask almost anything of his men when the time comes for the fighting. They will be glad to follow a leader like him.

Leave

A soldier going to war draws a line under the rest of his life the day he leaves his home to go to the front. The tasks of war require the whole man, detach him from his family duties and other duties as a civilian, and compel him to give absolute, unquestioning obedience. His military oath requires him to be ready at any moment to risk his life if necessary. All this calls for thorough-going detachment from his previous mode of living. He no longer belongs to his family, nor even to himself: he belongs exclusively to his country and his nation.

Yet, in the course of modern warfare, soldiers are granted leave from time to time to go to their homes; and the men feel very strongly that such leave is a gift of incomparable value.

Great caution and careful reflection are required, therefore, in preparing a list of men to go on leave; and the head of a Company will make every effort to see to it that full justice is done in every case.

When a man's turn has come to go on leave, he will probably be in the happiest frame of mind conceivable; more than likely such perfect joy of anticipation has not been his since the days of early childhood. The First Sergeant will give him the necessary instructions; whereupon, as soon as the purely official part of the business is settled, he will report to take his leave from the Captain. That will be an occasion for saying a few cheerful words, demonstrating that the Commanding Officer himself derives pleasure from the man's good fortune. And one must not neglect a word of greeting for the man's people at home.

Even more important it is to have a few hearty, soldierly words of greeting for the man himself when he reports back for duty: just a question from man to man, how everything is getting on at home. One might perhaps add a word or two of cheerful comment: "Well, I hope you'll feel better now, with all that off your mind. It's not a bad idea at all to go back once in a while—just to make sure everything is getting along all right."

A few remarks like this will make a soldier feel that his Captain knows what goes on in a man's mind; and that he is, after all, just a human being like the rest of us. In such a manner a genuine bond of comradeship is easily formed between officer and man.

Promotions and Decorations

Promotions and decorations afford some of the rare moments where it is found desirable to raise the individual soldier above the great mass of his comrades, by way of specially recognizing his merits. One must not forget that when a soldier is given promotion, his whole Company will feel qualified, more than on any other occasion, to sit in judgment on the proceedings. For that reason it is highly important that a Commander should never allow himself to be deceived by false pretenders of any sort. Persons of that type receive short shrift, as a rule, before the bar of public opinion in a company of soldiers. Granting a special reward is easy to decide upon if one of the eligible men has made himself conspicuous by competence and bravery under fire. It is very much harder to make the right choice under circumstances where the only standard available is the man's conscientious performance of routine duties. Before decorating a man or recommending him for promotion a Company Commander must be very careful, therefore, to find out all he can about him, and to consult fully with the Section Commanders. His decision in a matter of that sort will reveal his knowledge of human nature. If he has made a good decision, that is if the rest of the Company rejoices with the promoted or decorated man in his good fortune, the Commander's authority will be all the more firmly and conspicuously established.

The Company Commander and His Staff of Noncommissioned Officers

The real importance of noncommissioned officers for the Company's training and the development of its striking power could not easily be overestimated. It is one of the Commander's outstanding duties, therefore, not only to provide ahead of time for a group of capable successors, but also to develop among his noncommissioned officers genuine respect for their own position and true pride in their chevrons. They must realize that they are the Captain's right-hand men and that they hold a position of trust. They must be made to feel responsible for Company property and for the welfare of the men entrusted to their leadership. This responsibility must be accepted by them not as a burden but as an enviable distinction. Whenever the opportunity offers, each individual noncommissioned officer's duties should be discussed with him in detail; and in the course of such discussions the Commanding Officer should know how to impart the most favorable conception possible of the extent of their duties, showing interest even in the detail of their work, and proceeding simply by means of interrogation as well as by explicit control. The purpose to be kept in mind will be to train each man to judge for himself and make his own decisions; and the ultimate goal will be to have a force of noncommissioned officers who will always be glad to obey when obedience is called for, but also be able and glad to take the initiative if the situation demands it.

A period of quiet offers opportunity for the development and training of wholesome self-respect if the noncommissioned officer, aside from receiving the usual orders and commands, is called in now and then to give his opinion before the Commander has made his decision. ("There is a thing or two I want to get your opinion on.")

Very much can be accomplished at times simply by a brief word of encouragement. Just imagine a newly promoted young noncommissioned officer zealously at work in the line of duty, with the Captain stopping to look on. "Well, what do you say, Muller?" remarks the Captain. "How does it feel to be responsible for somebody else?" One can see an expression of pride come into the man's face: there is dawning in him a vague realization of the lofty ethos involved in taking responsibility. He is determined more than ever to do the very best he can.

Again and again every Commanding Officer should stop to remind himself that his noncommissioned officers more than anyone else in the Company will regard him as an example to imitate, and that his bad traits will be copied along with the good. If he is rigid and precise in his bearing, they will try to equal him in that. If he relaxes his self-control, an analogous trend will soon become evident in the noncommissioned ranks.

An unmitigated evil in any Company is the slave-driving type of noncommissioned officers. If it should happen that one of that kind is among his own men, the Commanding Officer must proceed immediately to put a stop once and for all to such doings. It is always a good idea, anyway, to check up unexpectedly on the inner workings of the Company. The result is at times surprising; and the surprises are not by any means pleasant every time.

A great deal depends on the First Sergeant. Officially regarded as "the mother of the Company," he is the Commanding Officer's first helper and exerts leading influence among the noncommissioned officers; and he is in a position to do quite an amount of educational work. To be sure, his tasks properly speaking are only concerned with internal duty; and yet it is important to get him interested in all of the many-sided activities of a Company and to keep him from developing into a mere pen pusher in the Orderly Room. A good First Sergeant will try to run the Company as independently as possible; and it may happen, if he chances to be a particularly forceful personality, that his efforts largely eliminate the influence of the Commanding Officer. The great art for the Commander is to keep the First Sergeant enterprising and in good spirits without losing control of the situation. Final responsibility is the Commander's. He is in command of the Company.

Mental Training

In giving attention to the intellectual life of the men of his Company, the Commander must realize to what extent the fighting spirit of his men will be influenced if they know what is at stake in this war. The task involved is one that any officer is capable of meeting, so long as he can muster the iron will that is needed to make the effort.

The daily newspaper and military news publications at the front, radio and books, soldiers' theatricals and other performances are among the agencies suited to keeping the mind active.

But far more effective is the instruction given by the Commanding Officer in person. He will make use in that connection of whatever material happens to be available to him, translating this material into the language of the soldier and bringing it closer to the minds of his men. In doing so, one must be careful to reduce the political facts to their simplest common denominator. The thing that a soldier most needs to know is that this war is a matter that closely concerns him, and that in fact it is his own war; that it is the people's war, a war in which his own existence is at stake and that of the entire nation, no less than the future of his children and children's children. Once he has thoroughly got hold of this idea, he will be able to appreciate also the value of his own personal effort and contribution. Mental training for the soldier is mobilization of head and heart. At the close of each lesson—and the lessons must not be too long—the soldier must feel that he can see it all very clearly now; and he must leave in high spirits when the meeting is disbanded.

If men can be found in the Company who have sufficient command of a subject of current interest, and are able to present their subject, the proper thing to do is to make use of them for such purposes.

Cultivating the Spirit of Service

The men of a Company will enjoy the performance of their duties so long as those duties are suitably chosen and arranged and properly carried out, especially if the Commanding Officer himself is always cheerful and energetic in the performance of his own duties. It is essential to make the men feel that their duties are imposed on them for perfectly good reasons and that they are learning constantly. Greatest punctuality is important in all maneuvers; and even for the larger maneuvers the men should not be made to fall in a minute earlier than necessary, lest they get the idea that their Commander is not good at planning. The very manner in which the Commanding Officer greets his Company in the morning is likely to provide a cheerful impulse to last the whole day. A word of praise after a great effort, as at a rest stop during a very strenuous march, will often accomplish wonders and stimulate further effort.

The ability to see the humorous side of things is indeed a gift of the gods. An officer endowed with that faculty will be able to dispose offhand of many difficulties that come his way. A mere gesture of the hand, one brief remark, will suffice at times to straighten out a situation that might create serious problems for a pedant without sense of humor. Humor is an expression of vigorous, healthy feeling and of a masterful attitude toward life. A spirit of good clean fun in the Company can only be regarded as a source of strength.

Attitude Toward Religious Questions

A Company Commander's only concern in formulating an attitude toward the religious life of his men will be to protect every man's freedom to cherish his own convictions. Personal views should be revealed by the Commander on rare occasions and with greatest reserve; no doubt should be left in anyone's mind, however, that problems of religion are to be touched upon only with the greatest of reverence.

Once More: Our Task

We officers should never pass a day without making clear to ourselves what obligations are implied in our trust. Each morning when report is made to us that the Company is "all present or accounted for" our glance should take

in every one of those 150 men, reminding us that back of them are 150 German families who placed those men at the disposal of their nation, and that the safety of those men was entrusted to that one Company and its Commander. What is going to be the judgement pronounced upon us by those families? "Our boy's Company Commander? The less said the better. That man, unfortunately, is one of those egotists who do not take the slightest interest in their men and who know nothing better than calling them down." Or will they say, with gratitude in their hearts: "Our boy has a good chief over him, anyway; there is nothing he couldn't do, with a leader like that"?

Such opinions uttered by the plain people of our country, the better part of whom are entrusted to our care, are judgments pronounced not so much upon our military capacity as upon our personal worth as an individual.

This is a question, too, which the Commanding Officer of a Company should frequently bring up for earnest discussion with the commissioned officers under his direction.

Let us work and live in such manner that our military leadership is joyfully acknowledged by our men because it furnishes for them a lofty example of cheerful responsibility, superior ability, and untiring care.

Assault of Fortified Positions

By

Major A. G. Trudeau, *Corps of Engineers*

Aside from the use of air and armored forces in World War II, probably no phase of military operations has gripped the imagination so much as the assault of fortified positions. Excellent descriptions of important German actions have been presented in *The Military Engineer* by Captains Paul W. Thompson and William Whipple, Jr., based on articles appearing in the *Militärwissenschaftliche Rundschau* and other German publications.

Siege machinery was probably used by the Persians and we know that Philip and Alexander of Macedon made extensive use of the then available equipment. The siege of Syracuse by the Romans in 212 B.C. showed many ingenious devices. Marcellus, the Roman consul, brought up vessels laden with siege equipment while soldiers armed with bows, slings, and darts kept down the fire of the enemy during the assaults. Only the genius of Archimedes held the Romans off until scaling ladders used under cover of darkness finally gave them a victory. Caesar's campaigns against the Gauls, particularly the sieges of Marseilles and Alesia, showed great skill and thoroughness in their prosecution. From the time of the Romans to the advent of gunpowder, siege operations deteriorated as few large armies existed under the feudal system and military operations were relatively ineffective and poorly executed. The rebirth of such operations has now reached new heights under German application utilizing modern equipment and other factors to be discussed later.

To assess a proper value to such operations and study them as to their possible effect on our own doctrine, it is necessary to analyze not only the tactics involved but many other factors relating to the French and German forces engaged. Some additional information can be gleaned from the Greek campaign. It may be from the Russian campaign, however, that most will be learned, if and when correct information can be secured. Let us attempt to analyze the technique involved in such operations.

A study of German operations in such situations appears in a recent issue of the Spanish military magazine *Ejercito* from which Figure 1 has been taken. *Ejercito* credits the German publication *Die Wehrmacht* with originating the article which deals with the assault of fortified positions such as the great Belgian fortress of Eben—Emael and the Maginot Line at Breisach. The plan of assault is substantially as follows:

Following a heavy bombardment with all available weapons including dive bombers, (1) assault engineer units (see Figure 1) make their way forward in accordance with a carefully planned schedule supported by artillery of all calibers, particularly by (5) antitank guns and (6) high velocity, flat trajectory weapons such as the 90-mm, dual purpose antitank-antiaircraft gun. The suppression of enemy machine-gun fire is one of the early tasks of (3) infantry with their supporting weapons. To screen (1) the assault elements who breach the wire and other obstacles encountered by the use of bangalore torpedoes (explosives) and wire cutters, smoke is utilized. The supply of all elements is effected by (2) ammunition carriers.

On the enemy left a similar envelopment is being accomplished by (4) an assault group supported by (7) chemical and (8) flame thrower units.

The assault group on the right (4) with supporting troops (7), (8), envelop the enemy left flank. After breaching the line of obstacles, assault elements close with the bunkers or fortifications and by the skillful use of grenades, smoke, explosives, flame throwers and machine weapons force the gun ports to be closed and the fortifications to be neutralized, destroyed or surrendered. In passing, it should be stated that the word "bunker" is here used in the generic sense implying a defensive installation or fortification either on a mound of earth or, in some situations, partially protected and concealed by such mounds. Thus, concrete pillboxes, turrets and similar structures for machine guns and heavier weapons have come to be referred to as bunkers by many writers and observers and the term is so used herein.

Again the question rises—how can a small group accomplish this?

Figure 2 portrays a segment of a typical fortified position. No attempt has been made to indicate the depth to which such a position should be, or might be, extended. To assist the explanation given below, three reinforced concrete structures such as photographs have shown the Germans encountered in the Maginot Line have been sketched, the center one housing two 75-mm (or heavier) guns protected on either flank by pillboxes containing two machine guns. These installations were of massive construction and built to withstand the heaviest shell fire that the French could conceive would be used against them.

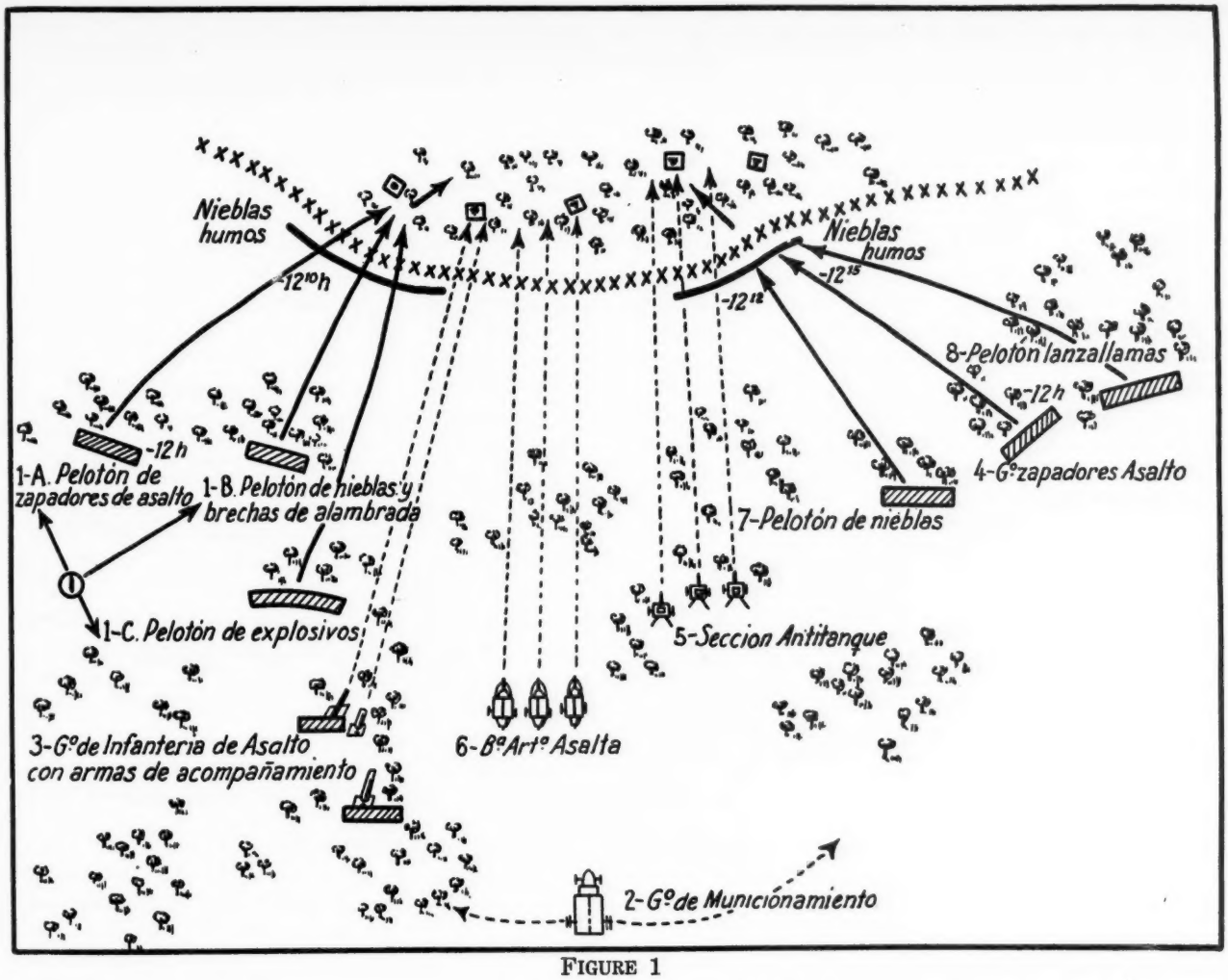


FIGURE 1

Translation of legend.

1-A Engineer assault platoon.
1-B Engineer wire cutting and smoke platoon.
1-C Engineer demolition platoons.
2 Motorized ammunition carriers.
3 Assault infantry with supporting weapons.
4 Engineer assault group.
5 Antitank gun section.
6 Mechanized assault artillery battery.
7 Chemical (smoke) platoon.
8 Flame-thrower platoon.

Let us consider only a portion of this assault and picture the attack on one bunker containing two or more machine guns. Such installations were common in the Maginot Line and were normally close enough to provide mutual support for similar bunkers or supplement and protect adjacent bunkers armed with cannon of various calibers. In order to insure support of the adjacent bunker and get the maximum effectiveness by enfilade fire, the ports on such bunkers were to the side rather than to the front. To gain sufficient overhead strength in steel and concrete to resist artillery fire and air bombing, not only were the side walls massive in thickness but the intervals between ports were considerable, normally about 60°-120°; in other words, at least one-sixth the circumference as a rule.

We must assume, of course, that bunkers adjacent to the one or ones being attacked were unable to render the normal supporting fires to their flanks due to direct artillery fire from close range against their ports throughout the close assault phase. This would indicate that alternate bunkers were assaulted during the initial action while those between were neutralized to be destroyed later in subsequent action. The tactics involved will, of necessity, vary with the situation.

This resulted in a wide angle of dead space to the front. Add to this area many large shell holes that could be used as cover by assaulting troops in the possible field of fire as well as in any dead space, consider the use of close range, high velocity cannon which registered effectively on gun ports in the bunkers and of smoke that practically destroyed the defenders visibility, and you have a picture that indicates why it was possible to close on a fortification defended only from within.

The successful accomplishment of such assaults has been the product of close cooperation by all arms. The close in attack on the bunkers however, has been the task of especially trained pioneer (engineer) assault units whose technique we will now discuss in more detail.

As mentioned before, artillery preparations of varying duration are essential to disorganize and demoralize the defender, damage or destroy his defensive works and obstacles and churn up the area around the defended position to provide cover for assaulting troops. The time and extent

of such preparations will vary with the situation and consideration of the surprise factor. Engineer squads, specially trained and equipped, then work forward under supporting fire and smoke with the initial task of breaching the enemy wire. This is accomplished by bangalore torpedoes and wire cutters. When the three or four men assigned this task have completed it, the entire squad with a variety of equipment work forward. Two or three men, for instance, may be armed with machine pistols, thermite and smoke grenades. Another small group may have explosive charges to place against the walls or ports of the bunkers. Still others may have explosive charges on long poles to shove inside the embrasure when the opportunity arrives. Since some casualties are bound to occur another unit for replacement purposes follows close at hand. Still another unit with special smoke and flame throwing equipment furnishes close support. Thus, a small group, perhaps only a platoon, by utilizing the support of all other air and ground forces and taking advantage of every shell hole, of every every lull in the enemy fire, of the screening effect of smoke and the disruption of the defense by the most opportune use of the various assault means at hand, close with the enemy until the weapons within the fortifications are useless and then proceed to capture or destroy the remaining defenders by demolitions and use of weapons.

It takes imagination and daring but it can be done at a sacrifice amazingly small compared to the mass assaults used in World War I. Of course, the caliber and technique of the defenders will affect the degree of success materially.

An interesting experiment is to build a rough pillbox out of wood and old canvas, place movie cameras to "aim" and "fire" instead of guns within, crater the surrounding area by explosives, erect wire and other obstacles, and then have assault units simulate an attack. Use smoke generously. Let the defenders "fire" their cameras as desired, aiming at any advancing troops seen. After the problem is completed, develop the films, remembering that only the soldier in the very center of any exposure would be a casualty if a machine gun instead of a camera had been used. Of course, firing through smoke would cause some casualties that cannot be determined from a clouded picture. The percentage would be small, however, and you will be surprised at the results showing how many men can close with the bunker.

Another means of simulating this situation is to tie colored balloons to skids and pull them past the emplacement at different angles and in different directions through shell holes, etc., while permitting machine guns in the bunkers to fire live ammunition at them. Use smoke for added realism but don't forget that your fire would be less effective if dive bombers, artillery, grenades and automatic weapons were directed at your bunker.

What then are the principal elements that have contributed to German successes? May I suggest the following:

a. Complete knowledge of enemy installations.

b. Thorough training of selected men under competent leadership and a unified command.

c. Availability of excellent equipment and thorough coordination in its use.

d. Air superiority.

e. Defection, low morale and, on occasion, inferiority of opponents.

f. Ineffective mobile defense or a lack thereof.

For thorough training under competent leadership, the German Army has no peer. The system of developing leaders even under the limitations imposed by the Versailles Treaty prior to the advent of Hitler resulted in capable, sound and aggressive leadership. All were carefully selected, thoroughly trained and, most important, imbued with the characteristics that differentiate the true soldier from a civilian in uniform. Courage, audacity and aggressiveness

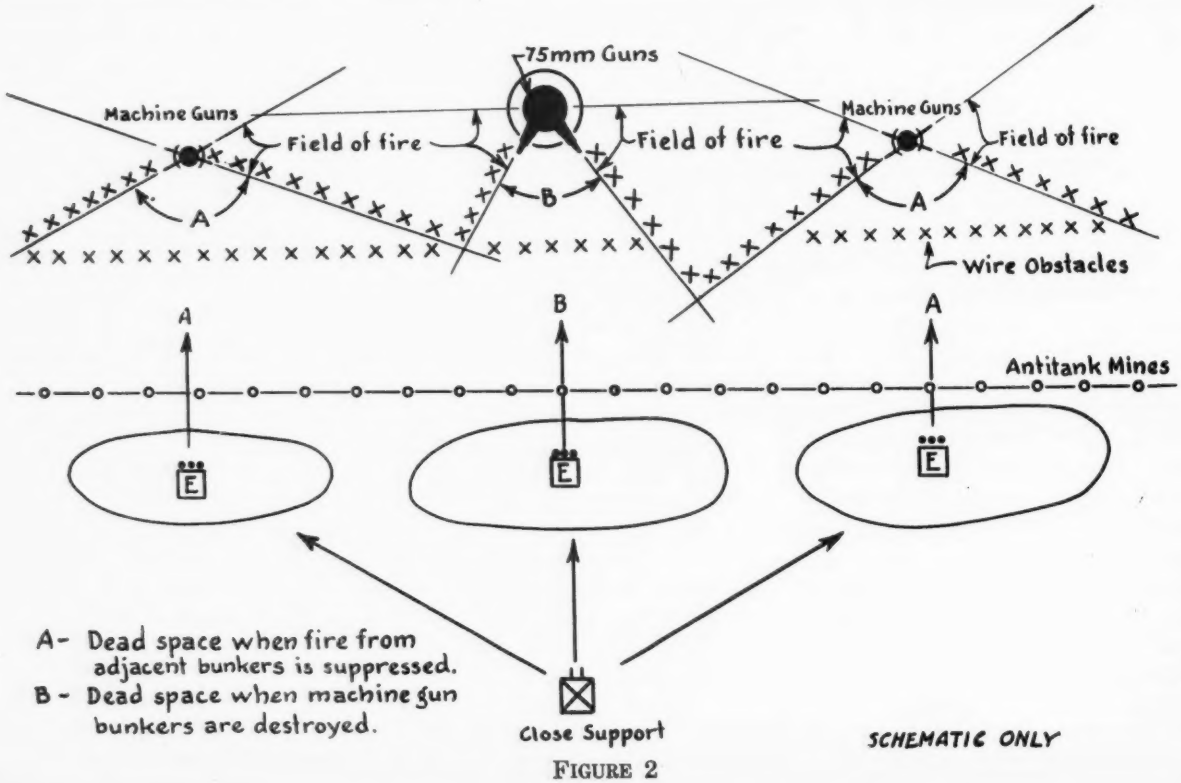


FIGURE 2

with a readiness for any sacrifice or hardship form the foundation of the German military structure.

By the application of the Einheit theory, individuals in the German forces are developed into carefully trained specialists rather than jacks of all trades. Only those psychologically fit are selected for service requiring the audacity, courage and ingenuity of assaulting seemingly impregnable positions and other comparable tasks. There still remain plenty of assignments where men lacking such characteristics may be used to great advantage. The success in these operations is to a very large extent dependent on each man doing his job without further orders once the attack is launched. The schedule of supporting fires and sequence of events has already been described. With little or no communications or observation for the most advanced elements, all concerned must act aggressively or suffer annihilation. The artillery preparation from large caliber howitzers provides plenty of shell craters for cover. The dual purpose antiaircraft-antitank weapons, with their high velocity flat trajectory shells, register with great accuracy on enemy ports at close range, assisting the assault troops by suppressing the defender's fire. Dive bombers supplement the effort to smother the enemy fire and prevent counterattacks. The closely coordinated use of these weapons permits the assault groups to close with the enemy and utilize their special equipment.

Close air support plays a prominent and vital role in such assaults. Air superiority is a nebulous and fleeting thing, but it can be accomplished locally at times even when the air arm as a whole does not have such superiority. The British withdrawal from Dunkirk is an example.

The Colmar attack on the Maginot Line loses some of its impressiveness due to the admittedly low morale of many of the French troops involved and the withdrawal of the best troops for use elsewhere. The defenders had experienced months of passive defense with the resulting moral disintegration that such inactivity and apparent security causes. As Andre Maurois wrote in a recent article, they were called "crews" with all the psychological import of merely manning or holding their immediate positions. They afford a perfect example of what personnel, trained principally for passive defense in a country where subversive influences had undermined to some extent the will to fight and live with courage or die with honor, will do in the crucial hour. At Breisach their mine fields were inert, their weapons only partly manned and the elements that should have been counterattacking were but partly dressed in their bunks when captured.

As a supplement to this whole subject, the problem of how to properly defend such installations arises. Surely, such powerful structures must have real value in enabling the defender to survive the fires of preparation and meet the actual assault. Yes, beyond question they have great value when they are assigned their proper place in the defensive scheme. We must remember that such forts are only gun turrets or battleships of small size *without* mobility. Imagine what would happen to such a ship or such a fleet at sea. How is mobility effected in such a fortified area? By mobile troops and reserves who dispute the close attack at the appropriate time by emerging from shelters and defeating the attacker in close combat.

Even though a well prepared force can effect surprise to a certain extent in such assaults, artillery fire and Stuka attacks must lift before the final assault can be made. Where should the defenders be at this time? Manning bunkers and pillboxes where they can make fire effective and also opposing the attack from hasty positions, shell holes, earthworks and by hand to hand combat until the counterattack is launched. I believe military authorities will agree that there have been many more battles lost because of delayed counterattacks than due to too early use of reserves. To permit a fortified position to be defended by passive means only, no matter what the strength of its installations, will subject it to the risk of defeat by a resolute and persistent enemy. Furthermore the force of a modern attack requires great distribution in depth in order to contain an enemy who is successful initially until the full force of elements available for counterattack can be imposed on the attacker.

The capture of Eben-Emael was effected through use of a technique quite similar to that used at Breisach, some parachute troops having been utilized, however. Again the inaction and indecisiveness of the defender shows forth. Furthermore, treachery in the guise of fifth columnists appears to have played an important role with all due credit to the courage and ability of German arms.

The action along the Metaxas Line showed greater determination on the part of the Greek forces while the German assault units were handicapped by the steep slopes and inability to bring their 90-mm dual purpose guns into position. The Greek failure (or inability) to counterattack as their principal positions were outflanked contributed to the surrender of their fortifications. It is questionable also as to whether or not positions at such elevations in the mountains are desirable despite the rugged terrain confronting the attacker inasmuch as constant clouds and fog reduced the defender's field of fire to practically nothing at times.

As for Russia—who knows. It seems apparent that Russian courage and stubbornness are taking a heavy toll of the invader. Morale and the availability of supplies are unknown factors, of course. Furthermore, the original front has been pushed back from 100 to 300 miles and several fortified lines may have been pierced. On the western front, the major assaults were practically along the line of initial contact. It appears from meager information, however, that the Russian defense is probably characterized by (1) greater depth of mutually supporting positions, (2) opposition from ground troops outside of bunkers during final stages of the assault on a position after artillery fire and air bombing has lifted, and (3) more prompt and effective counterattacks.

Our doctrine as set forth in Field Service Regulations, FM 100-5, considers four phases in attacks on fortified positions; namely:

"*a.* Reducing the hostile outpost system and gaining close contact with the main position.

"*b.* Breaking through the fortifications at the most favorable point.

"*c.* Extending the gap by isolating and reducing hostile emplacements on its flanks.

"*d.* Completing the action by moving mobile reserves through the gap to complete the encirclement and isolation of remaining fortifications while continuing the attack against them from the front."

Our doctrine states that air supremacy is the first requirement for such operations and stresses the need to exploit the success of each phase without delay.

It is impossible to put too much stress on preliminary preparations. Military intelligence of a high order is required. Aerial photographs and sketches and plans of the terrain and installations involved are essential. Training of selected groups and detachments must be carried out in great detail. The procurement and cooperation in the use of suitable equipment is vital. Throughout all these preparations, secrecy must be maintained. After the assault is launched, any further surprise can be obtained best through speed and deception.

Once artillery fire has registered successfully, smoke and fog will be advantageous to the attacker as a rule inasmuch as the disruption of close-in enemy fires is essential to the assaulting elements.

Flame throwers have great moral as well as physical effect. The use of such equipment which has considerable weight, limited range and an extremely brief period of use before recharging is necessary, is being carefully studied. A few comments on flame throwers may be of interest. This weapon was first used by the Germans at Malancourt on the Western Front in February, 1915, and the Allies quickly constructed a similar type. All flames throwers are built on the same principle; that of mixing a compounded oil with a gas under considerable pressure and igniting the mixture with a spark or fuse. The range depends principally on pressure and the thickness of the oil stream. Portable flame throwers of the German type are said to have a range of approximately 35 yards and a duration of fire betwen 30 and 40 seconds, in a constant discharge or in short bursts if desired. Flame throwers of a fixed type such as might be installed in tanks would probably have at least twice the range and duration of fire. In addition to generating a heat of 1000° F. or more, flame throwers create a dense black smoke which affords temporary cover for its advancing operator and other troops screened by it, even when beyond effective range of the weapon from the enemy. With all due respect for physical effect, it must be stressed that in its moral effect lies the principal value of the flame thrower.

Grenades, smoke and explosives, supplemented by automatic weapons are certainly essential items of equipment. To these must be added equipment required to breach enemy wire and other obstacles.

Unity of command insures coordination of effort. Thorough terrain appreciation by every individual concerned is essential to permit the maximum use of all available cover. This must be supplemented by plotting in advance, and sensing during the assault, the dead angles between emplaced enemy weapons.

There must be no delay between the neutralization of a locality and the arrival of supporting units to mop up hostile troops engaged outside of bunkers and break up counterattacks; in fact, such troops should furnish close support by the time assault detachments are closing with the enemy.

The maintenance of communications is essential if the breakthrough is to be exploited. Highly mobile forces of great firepower must be pushed through any gap secured, leaving enemy forces on their flanks, if need be, to be defeated in detail by other advancing reserves. This can only be accomplished by adequate reserves strategically placed and utilized to their full capacity.

It is true that the German Army were able to prepare for such attacks against enemy positions concerning which they had detailed knowledge. They also knew the technique of the hostile defense. As Captain W. K. Wilson, Jr., C.E., brought out in his excellent article on "Current Trends in the Use of Engineers in Combat" (The *Military Review*, June, 1941)—while we are not justified in training any considerable number of troops in such assault tactics, the formation of one or two assault battalions at this time with the mission of developing and perfecting weapons and technique for such assaults is worthy of serious consideration. Such a nucleus would be of tremendous value whether used intact against fortifications of limited or great extent or as a cadre to train other and larger units.

In conclusion, it would appear that: (1) Stress should be put on the selection or assignment of men to such tasks requiring great courage and resourcefulness.

(2) Thorough and detailed training must be given in the specialty being considered.

(3) The highest degree of coordination must be achieved between all troops and in the use of all equipment prior to the attack.

(4) Reinforcements and supplies must be pushed forward with maximum speed despite enemy opposition and losses in order to overcome counterattacks, complete the breakthrough, annihilate the enemy and exploit all success to the limit.

(5) Defensive positions must be in great depth. Strong fortifications of the permanent type while affording greater defensive strength at critical points do not, per se, effect economy of force either in the number or quality of the defenders.

(6) Success in defending such a position demands well-trained and alert forces imbued with the offensive spirit and prepared to counterattack effectively and vigorously.

(7) Our American doctrine is sound and can be applied successfully should occasion demand.

The Brunt of the Battle

By

Colonel Martin C. Shallenberger, *Infantry*

The smashing German successes of the present war brought to the attention of military experts certain new uses for weapons and new techniques, the value of which had not been recognized before. Among the methods which the Germans so convincingly demonstrated were the use of armored divisions to exploit breakthroughs on a large scale and in some cases to make the breakthrough, the use of aircraft to provide direct and close support for ground troops in offensive operations, the use of air-borne troops to shatter the nerve centers, near and remote, of defensive resistance. No one can deny that the German triumphs necessitated a far-reaching revision of values. The question arises: What has become of the role of the infantry which was once the Queen of the battle and the artillery which was her royal consort? Has its usefulness diminished? Is it to be relegated to the scrap heap? The answer probably is that in the eyes of the public and the press it has been and will continue to be quite eclipsed by the more spectacular arms such as the armored and air troops. But in the eyes of the soldier who knows who bears the brunt of the battle—what is the answer?

The plain, accurately reported story of the present war from the Polish Campaign to battles in Russia proves that there has been no substantial eclipse of infantry and artillery, that infantry and artillery are still vital elements in warfare, providing the fundamental basis and drive for the thrusts which the tanks and planes so brilliantly exploit. It is still necessary to take and hold ground in order to win battles and hence to win wars. The infantry-artillery team is still the main reliance for this. German military authorities have consistently pointed out that their air force and their armored divisions were just two elements in a complex military equation, wherein the foot soldier and the cannoneer were the basic factors.

Let us analyze the evidence bearing on this question. The press and radio have been inclined to place their accent largely on the operations of the armored divisions and those of air and air-borne troops. Those are new and flashy arms which are playing a striking role and which lend themselves naturally to colorful stories and screaming headlines. This consistent emphasis on the operations of those arms has obscured the exploits of the less colorful but equally important line troops, to the extent that the impression has often been created that all the work is being done by the special arms. It is similar to football where the line does the heavy work while the press and the public's eye is on the halfback who has carried the ball. But look at the figures. From latest reports the German Army consists of 260 divisions, 240 of which are infantry divisions, 20 of the latter being motorized. There is no evidence of any oblivion in those figures. They realize, as do all soldiers, that the gains in war which can be counted as "in the bag" are only those which the line troops have secured and hold. In the German Military Review, August 2, 1940, their opinion regarding this subject was expressed as follows:

> ". . . The courage and efficiency of the individual soldier is the decisive factor, regardless of the technique employed. The infantry constitutes the main arm, and is supported by all other arms. . . . If our aviators and tanks have succeeded . . . this merely proves that our troops of all arms have been properly trained and not that the importance of the infantry's missions has diminished.
>
> "The bulk of the infantry must rely upon the cooperation of the artillery; the various engagements in Poland and the decisive attacks upon the Weygand Line and the Maginot Line have demonstrated this fact. They have proved that the enemy's last resistance must be broken, as hitherto, by the infantry, and that in the last hundred meters of a charge the infantry must accomplish this result unaided and solely by force of its own weapons.
>
> ". . . it should be stated that the endurance and tenacity shown by the infantry in the present war was the decisive factor when it was opposed by an equally tenacious enemy. Therefore, when initial successes were swiftly developed by the command into strategic successes, there occurred through employment of all arms a pursuit of the enemy unparalleled in the history of the world. It was this fact that was new to our foes. They call it blitzkrieg and talk of our secrets. The great successes obtained by all arms group themselves about the victory of the infantry which, as the principal arm, overcame the enemy man to man, and thus triumphed over his technique."

The impression generally prevails that armored troops are the ones used to lead the assault, break through the enemy's fortified position, and cover the operations of the line troops that follow in their wake. This may or may not be the case depending on the resistance to be met. They are now generally used in another way. This is one of the new techniques which the Germans have brought forth in the employment of armored troops. In 1918 the role of the armored troops was to assist the infantry in breaking through the enemy's line, creating a gap through which exploitation troops were pushed. In those days tanks were very slow and there were few antitank guns or obstacles to be met. Now the situation is different.

Let us analyze a modern battle. The troops opposing each other at the start are usually line divisions. One side decides upon offensive action and seeks for a soft spot in his opponent's line where he thinks he can effect a breakthrough. Antitank weapons, mines and obstacles are likely to be found in all places favoring tank attack and are ready to meet the tanks. Artillery has become antitank minded and is prepared to join the battle against the tanks with direct fire. Tanks, on the other hand, have gained great speed and can go far and fast when the going is good. In such situations the line of action has, therefore, been reversed. The problem of breaking through the defensive area and creating the gap in the enemy's line has been handed back to the line troops. Infantry and specially equipped and trained engineers with powerful and active artillery support must now penetrate the enemy's defensive area and clear the field of antitank obstacles, mines and antitank guns—in other words, to clear

a way for the armored troops to get out into the open. Here is the brunt of the battle and it is still borne by the line troops. If the line troops succeed and a gap is created the armored troops plow through the gap, and by utilizing their vast fire power and speed they exploit the success which has been gained, much the same as the cavalry did in the old days. They try to create havoc in the enemy's rear and convert the initial gains into a decisive success. How far they can go when out in the open depends upon the resistance that they meet in the enemy's rear areas. Again, this is like the football game wherein the line men punch a hole in the opposing line and open a gap for the half-back to dash through. If he gets into the open he can make a long gain and is stopped only by the enemy's rear area defense. If he is stopped, the line must come up and again repeat the operation, but the success of the whole play has depended on the line troops who have opened the way. Never mind if the press writes only of the exploiting troops. They are not getting any undeserved glory. The half-back has carried the ball for a big gain. Fine! But the coach knows that it was the work of the line and those doing the blocking that made the success possible. All soldiers know that credit is also due to the line troops in a successful operation.

Tanks have many limitations, one being that they are very susceptible to adverse terrain and very dependent on their lines of communication, which means gasoline. Once this line is cut they are practically dead, or at least very badly crippled. They are also very susceptible to gun-fire and, being an expensive arm, they cannot afford to expose themselves unnecessarily to the inexpensive antitank gun. The result has been a complete reversal of the theories of their employment when compared to the days of World War I.

Armored troops know the value of infantry support. They even carry their own infantry with them to overcome resistance which is put in front of them after they have passed through the gap. Each armored division carries a regiment in lightly armored trucks for this purpose, and their operations are closely supported by other motorized infantry to assist them in overcoming obstacles. If the resistance in the rear areas is strong and the advance bogs down, they have to wait for line troops to come up and clear out this resistance. Thus it is plain that when the going is hard the job falls to the line troops. The brunt of the battle is theirs.

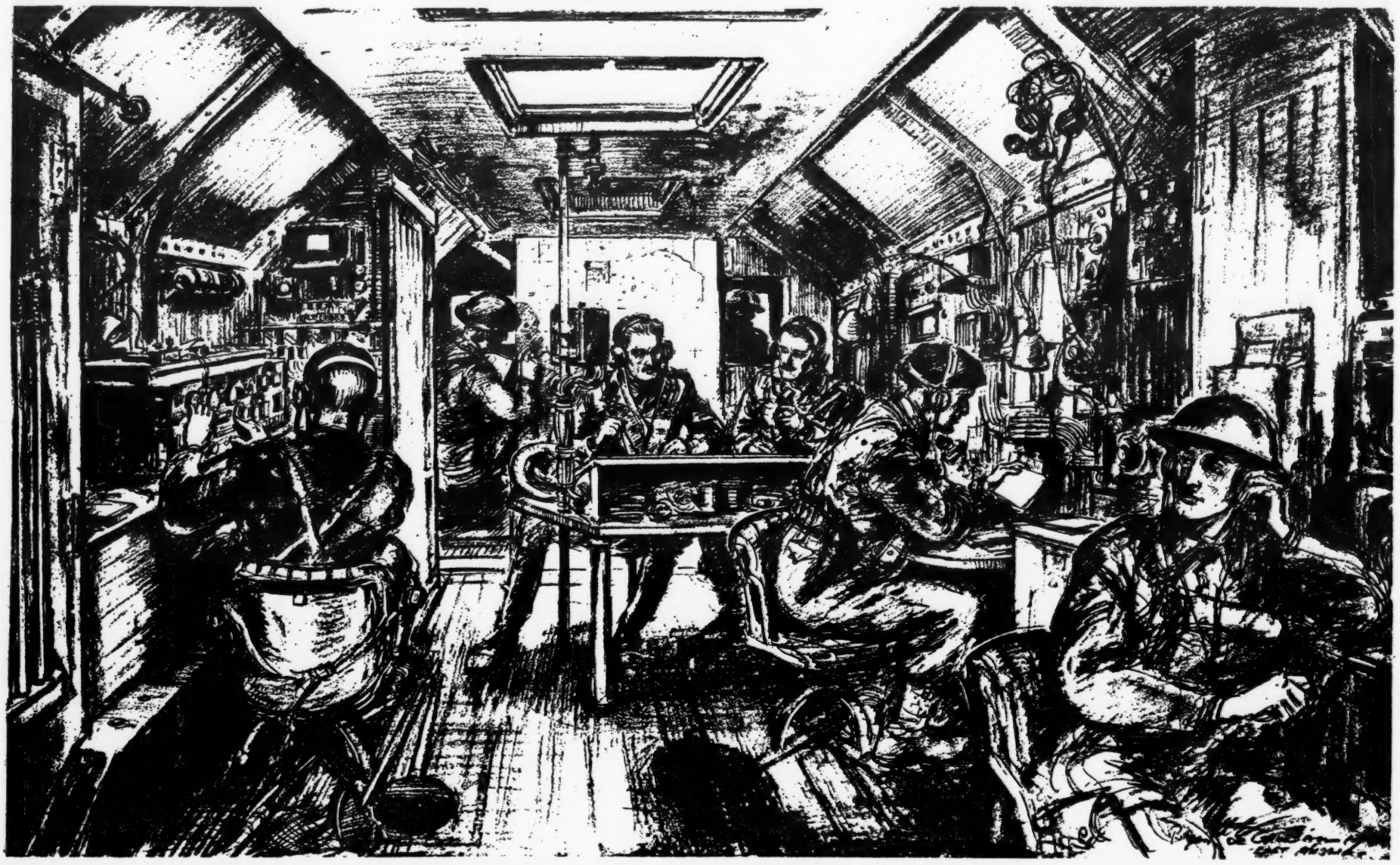
On what do the Germans really rely for their success? It is the combat team which is composed of *all* arms formed into a well balanced fighting force—all imbued with a real fighting spirit. It is this correct combination of arms with the will to win—each playing its appropriate role—which has been the secret of their success. As in football it is team play which wins.

The action of the artillery has been improved, and its combat power increased in the light of present-day military experience. In the modern army it has become a more aggressive, more mobile, rough-and-ready artillery. Much of the artillery is now brought up close into the fighting area, its commanders and observers right up with the infantry fighters where they can observe and place their fire where it is needed. Assault artillery has been developed—artillery pieces, on caterpillar treads, attached to small infantry units, moving ahead with the foremost attack echelons, using direct fire over open sights to smash enemy resistance wherever it appears. Artillery is now prepared to take part with direct fire against tanks or other armored vehicles. This fighting infantry-artillery team has been largely responsible for the success of the German army.

Armored and air troops will probably remain the stars in the eyes of the public as do the half-backs on the football teams. I do not wish to belittle the importance of the part to be played by those troops. Their role is most important. There can be nothing so thrilling as their part in the battle. It is like being the half-back. Every football player would like that role. The thrills of fighting in the open are all his, but the ones who have also got to be good or there is no play at all are the ones who clear the way. We must not overlook the ones who bear the brunt of the battle.

"During the drive into France columns of traffic flowed all night long through the Sedan gap, three abreast on every road, at the full speed of which the machines were capable. It was tank trucks moving in this way, and not pipe-lines, as sometimes reported, that kept the mechanized elements in fuel. And it was foot infantry, marching down these roads in the same fashion, and not the mechanized elements, that did the real hammering. The tanks were merely the cutting head of the drill; its true strength was furnished by the shaft; and the secret of the German army's success was in the intimate union of shaft and head, the complete coordination of all arms."

America and Total War—Fletcher Pratt



MOBILE HEADQUARTERS OF A FAST BRITISH TANK DIVISION

In this war, where rapidity of movement has been stressed by every military expert, the Tank Divisions are no laggards. Above, the artist, Captain de Grineau, has drawn the interior of a Command Vehicle of a fast-moving tank division. These, originally facetiously nick-named "Gin Palaces," are now dubbed "Dorchesters." This armored vehicle houses seven—a Brigadier, his Brigade Major, Signals Officer, Intelligence Officer, two wireless operators and the driver—all of whom are shown in their proper positions during an operational advance, with the Brigadier in the center, seated at the control desk, giving operational orders to the Brigade-Major by his side. Behind him is a back view of the driver, on the right the Signals Officer at the interception wireless set, and in the right foreground an operator at the "house" telephone set. On the left is the wireless operator at the command wireless instrument set, and left, behind the Brigadier, the Intelligence Officer, who sits beside the driver, leaning back and marking-up a large sectional map which denotes the route of approach. On the floor, left, by the operator, is a signalling disc for calling up a scout-car or despatch-rider.

—*The Illustrated London News*, 28 June, 1941.

Armored Armies

BY

LIEUTENANT COLONEL JAMES C. CROCKETT, *G. S. C.*

G-2 ARMORED FORCE

It will be noted that the Germans changed their tactical employment of the armored divisions for the campaign on the Western Front. This change was based on actual battle experience in Poland. The great success of these "armored armies" in battle indicates that the theory of using them for the strategic main effort is sound. It is believed, however, that the tactical main effort should, when there is an organized resistance, be made by the infantry-artillery team strongly supported by aviation, engineers and GHQ reserve tank battalions. —THE EDITOR.

To all who have access to the mass of reports received from various sources describing German military operations, it is quite evident that Germany has developed a new battle technique. That the use of armored units is an important factor in this new battle technique is also quite obvious.

As in the case of all new fighting means the battle use of armored units has undergone and is undergoing a continuous development. Technical changes in armor, arms and vehicles make changes necessary in tactics. Tactical development, of necessity has progressed side by side with technical development.

Although the tactical use of any fighting means is largely dependent upon the particular situation under which these means are used and tactical procedures must be highly flexible, nevertheless proper tactical procedures are as susceptible of proof by factual data as are more concrete matters. It is upon the above premise and a careful study of a large amount of documentary evidence that the statements made below concerning the tactical procedures of the German armored army is based.

At the beginning of the present war (World War II) the concept underlying the use of armored forces in France, Great Britain and in Germany were in general similar. This concept as stated by General Gamelin in March 1940, only two months before the German offensive was "A large armored unit cannot cover its own movement nor carry out the reconnaissance of an insufficiently located enemy. It must always act within the cadre of a corps or of a larger formation under the orders of the Commander of such forces."

As can be seen from the above statement, even after the experiences of the Polish campaign were available for study, the French had no concept of the unified tactical action of the combined arms grouped in a large armored formation. Further they failed to grasp the obvious lessons of the Polish campaign as to the supreme importance of the role of combat aviation combined with the armored formations.

At the outbreak of World War II, Great Britain had three types of mechanized units; the mechanized divisional cavalry regiment, the army tank brigade and the armored division. The tactical role of the army tank brigade was, with the assistance of the infantry to break through enemy defenses. The role of the armored division was to penetrate beyond the defensive position in order to complete the victory. Thus the concept underlying the employment of British armored units, like that of the French, was that these units would be organized to act within the cadre of the old style larger formations.

The German army entered the Polish campaign with the same general concept as to the organization and employment of armored units as stated above for the French and British. During this campaign the armored divisions were not held together and each fought as a complete armored unit. The armored divisions operated within the cadre of the several old type armies.

We find an entirely different tactical employment of the armored divisions when the Germans began their campaign on the western front (May 10, 1940). For the initial and subsequent attacks against the French we find the armored divisions organized into armored corps and into an armored army with one or more motorized infantry corps attached. This armored army furnished its own covering and reconnaissance forces and attacked initially across terrain heretofore regarded by the several general staffs as unsuitable for operations of large formations. This armored army with its own means, using only the combined arms of its component elements and supported by combat aviation moved 100 miles in three days against hostile opposition and forced the crossing of the Meuse River, a very formidable barrier, in the face of a hostile army. In this connection it is interesting to note that the speed of operations of armored formations in later campaigns have equalled those established in France. The average rate of advance for the German armored divisions during recorded operations is approximately as follows:

French campaign	20 miles per day
Greek campaign	22 miles per day
Libyan campaign	(Rommel's Corps) 30 miles per day for 10 days.
Russian campaign, advance on Smolensk from 22 June to 17 July about	23 miles per day.

While the speed attained in the above mentioned campaigns may, on account of special conditions or on account of better defensive means be reduced in later campaigns to zero or to the speed of the foot troops; the fact remains that an armored army will always represent a potential threat of operations conducted at the tempo of past operative performances.

The necessity for coordinating supplying, exploiting and properly supporting operations of divisions and corps moving at the speed named above indicates clearly that an agency (army) to carry out these functions must be organized. The army and all its component units must be as mobile as its principle combat elements.

The initial thrust through the French lines, across the Meuse and beyond was, of course, the foundation for the subsequent successes of the German Field Forces in the Western campaign "A breakthrough is in itself a difficult military operation based upon extreme daring, as was learned in World War I. It consists of a series of operations merging into each other, (1) breaking into the position, (2) breaking through the position, (3) turning off to right and left, (4) simultaneously pushing ahead. Freedom of action must never for a moment be lost, at the same time it is necessary to effect a continuous flow of forces into and through the gap. Each of these actions is essential to the success of a breakthrough operation. If anyone of them miscarries, the total enterprise may be endangered. The World War taught us that continual surprise and rapidity of action are essential prerequisites for a successful breakthrough. Such World War I experience has been substantiated in subsequent wars." The difficulties experienced by the German armies in breaking through the Stalin defense zone illustrates clearly the necessity for this successful sequence of operations named above.

The German army which conducted the breakthrough operations in France and in Yugoslavia was an armored army. By armored army we do not mean an army of tanks. We mean armored and motorized units of infantry, artillery, engineers, tanks and signal troops together with their armored and motorized services and reserves, combined in divisions and corps and supported by combat aviation formed an armored army, the headquarters of which was likewise armored and highly mobile.

Speaking of the breakthrough operations on the western front May 10, 1940, an officer of the German General Staff has said: "For the first time in history an armored army made the strategic main effort of the German combat forces."

A careful reading of the mass of various reports from abroad describing German operations in Greece, Yugoslavia, Libya and Russia indicates clearly that the Germans in these campaigns also used an armored army for the spearhead of their main attacks.

A recent issue of the German Military Review *(Militärwissenschaftliche Rundschau)* published by the German General Staff gives a clear picture of (1) how the German armored army is used (2) how the German claim of maintaining a fluid front is achieved.

Summarized briefly the article quoted above shows the following:

(1) The enemy front is penetrated by driving several armored columns deep into the position.

(2) In the wake of the tank penetrations *support points* are immediately built up by infiltering armored units of combined arms into the *support point area.*

(3) These *support points* are established deep in enemy territory by what we may call *unit infiltration.*

(4) The infiltering armored units avoid combat until their arrival in the *support point area.*

(5) Having established firmly these *defensive support points,* they are used as a base of further offensive operations by the armored units.

(6) The elements of resistance avoided and left behind are now mopped up by oncoming units or by units operating from the strongly established *supporting points.*

(7) These *support points* are strong terrain localities.

(8) *Support points* are established to give security to tanks and other forward armored units.

(9) Armored infantry, carried in armored troop carriers, are used in moving through the battle areas to the new established *supporting points.*

(10) The units initially establishing the *support points* are highly mobile. All impedimenta which interfere with the mobility are left behind until the *support point* areas are strongly held by combined arms.

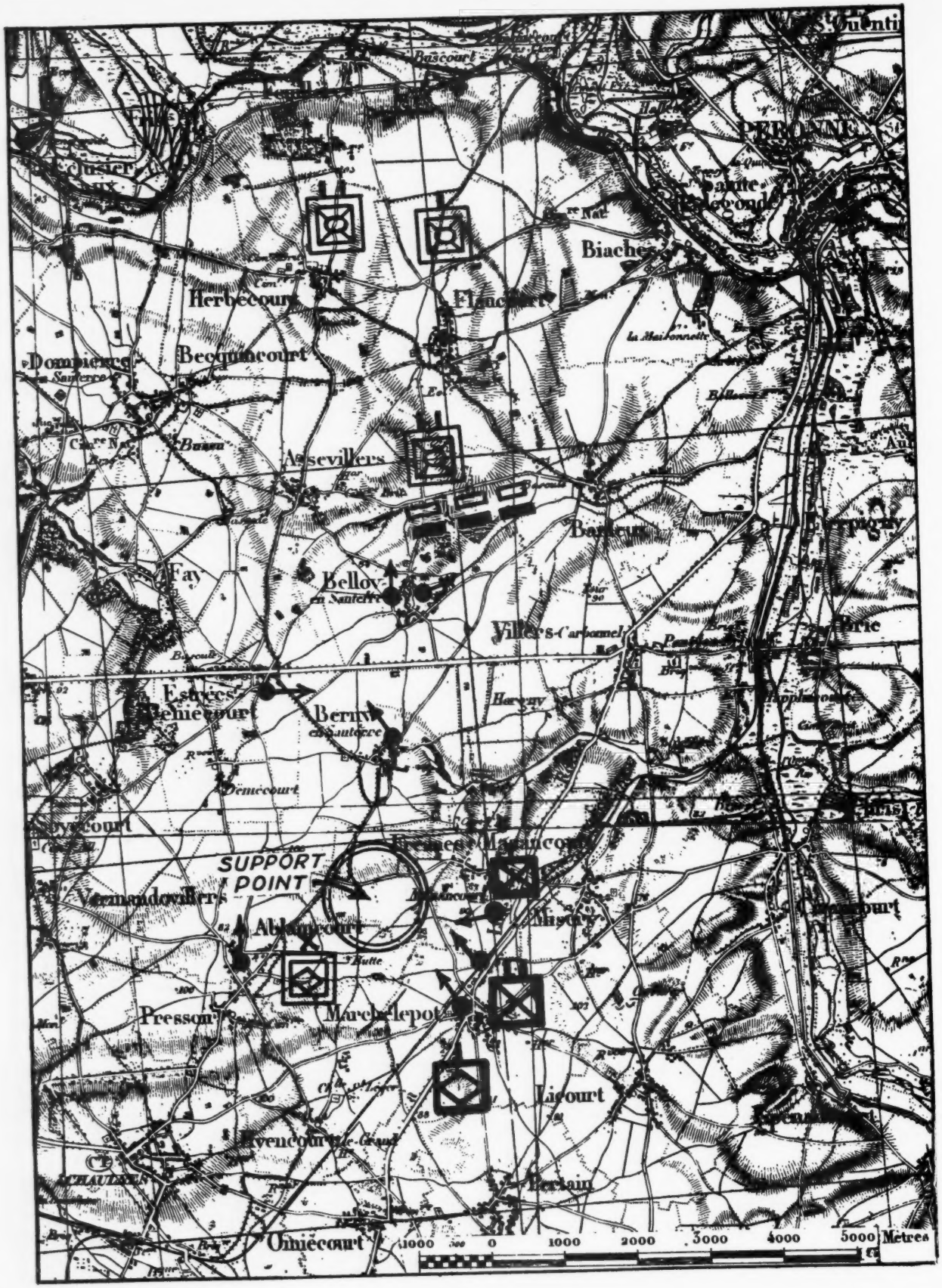
(11) Radio communications at first bridge the battle area between the *supporting points* and the base of infiltering units.

The following quotation from a battle study published by the German General Staff gives point to procedures stated above. "Thus an outstanding success was achieved by the establishment of a strong *support point* in rear of the enemy without serious loss to us. This achievement was mainly due to the exemplary coordination of the combined arms."

It is interesting to note that the same principle underlying the above mentioned tactical procedures was applied in World War I by the 2nd American Division during the Argonne operations by a night penetration made by the 9th U.S. Infantry.

The new battle technique of the Germans in maintaining a mobile battle front is accomplished by the use of an armored army. Such an armored army in the hands of our GHQ would make available a highly mobile offensive striking force the success of which could be utilized by slower moving armies.

"The blow, wherever struck, must, to be successful, be sudden and heavy."
General R. E. Lee in *R. E. Lee,* by Douglas Southall Freeman.


SUPPORT POINT
Herbécourt
Becquincourt
Assevillers
Belloy
Fay
Estrées
Berny
Villers-Carbonnel
Biaches
Flaucourt
Barleux
Abbécourt
Marchélepot
Pressoir
Licourt
Omiécourt
Berlaimont
1000 0 1000 2000 3000 4000 5000 Metres

Armored Infantry in Action

By

Lieutenant Colonel James C. Crockett, *G.S.C.*

G-2 Armored Force

A battle study of a small unit of armored infantry, published in a recent issue of the Military Quarterly issued by the German General Staff, gives an excellent insight into the methods used by a German Armored Army in breaking through and in disrupting an enemy position.

In order to give emphasis to the methods used by the Germans, I have separated the situation, as presented in the German study, from the solution as described in that study. The situation and requirements, with a map (Page 22), are presented with this article so that the reader may make his own decision as to a solution. The solution as made by the German Commander immediately follows Requirement No. 7.

SITUATION

Early afternoon, June 5, 1940. 1st Company, 12th Armored Infantry (4th AD) was resting at a farm about 700 yards north of Flancourt. The remainder of the Battalion (I) was in the vicinity of Herbecourt (see map). South of Flancourt, other German Armored Troops in hard combat with the enemy (French) were held up. Scattered units of this force were South of the Assevillers—Barleux Highway. The Tank Brigade of the Division (4th AD) having forced its way south through the enemy defense line had reached the hill about 1½ miles northwest of Marchelepot.

At 3:00 PM the 1st Company received the following orders: "Move through Barleux and establish a strong *support point* on the heights about 1,700 yards east of Ablaincourt. Our tanks will assemble in that area. After establishing the position, the armored train will be sent to the rear lightly manned. Other companies of the battalion will be sent up on the armored train to widen and strengthen the *support point*." Attached to the 1st Company are the following:

2 Infantry Guns (75-mm Self-propelled)
4 Heavy Machine Guns
1 Radio Unit (team)
3 Antitank Guns (37-mm)
2 Mortars (81-mm)

REQUIREMENT NO. 1

Action prior to move of Company.

REQUIREMENT NO. 2

Estimate of hour Company can move.

SITUATION (Continued)

On crossing the Highway Assevillers—Barleux, the Company attached several scattered infantry units whose attack had been halted by enemy machine-gun fire.

Having barely crossed the road, the Company met heavy machine-gun and mortar fire from the village of Belloy-en-Santerre.

REQUIREMENT NO. 3

Action, if any.

SITUATION (Continued)

At the Highway Estrees-Deniecourt, Villers-Carbonnel, hostile artillery opened fire attempting to prevent our crossing the road. Machine-gun fire came from Estrees-Deniecourt and Berny-en-Santerre.

REQUIREMENT NO. 4

Action, if any.

SITUATION (Continued)

Approximately 700 yards west of Berny-en-Santerre, a battery of our own artillery was met. It had found protection in a gully after being unable to follow the Tank Regiments.

REQUIREMENT NO. 5

Action, if any.

SITUATION (Continued)

Shortly before arriving at the high ground east of Ablaincourt, the Company was halted by strong machine-gun and antitank fire from an easterly direction.

REQUIREMENT NO. 6

Action, if any.

SITUATION (Continued)

The Company gained the high ground east of Ablaincourt as directed.

REQUIREMENT NO. 7

Action, if any.

Solution to Armored Infantry in Action

Following is the German Commander's solution to the problems presented in the situation as outlined in the above article.

SOLUTION TO REQUIREMENT NO. 1

The guns were hooked on to the armored train in compliance with Division orders. Likewise, the heavy machine guns were loaded on the vehicles, while the ammunition and crew of all weapons were distributed among the infantry units. All wheeled vehicles, including motorcycles, were left behind. A radio unit loaded on an armored vehicle and assigned to the Company Commander served as liaison and contact with the battalion remaining behind temporarily. By means of this, the various locations of all units were to be reported by prearranged signals.

SOLUTION TO REQUIREMENT NO. 2

At 3:55 PM the reinforced Company fell in after the reconnaissance of the route of Flancourt had been made. The Company utilized all terrain features for protection in

the advance towards the enemy. An artillery section in position southwest of Flancourt was requested to support the advance of the Company by fire covering the flanks. Especial attention to the villages Assevillers, Belloy-en-Santerre, Estrees-Deniecourt, Berny-en-Santerre and Fresnes-Mazancourt.

SOLUTION TO REQUIREMENT NO. 3

Without regard or distraction, the Company continued to follow the route of the tanks, which were driving a spearhead towards Ablaincourt.

SOLUTION TO REQUIREMENT NO. 4

In spite of heavy firing, the enemy failed to deter the Company as it continued the march by detour around the points of artillery concentration.

A narrow path between Estrees-Deniecourt and Berny-en-Santerre was traversed at a high rate of speed under heavy enemy machine gun fire from both sides.

SOLUTION TO REQUIREMENT NO. 5

This battery, which was sorely needed, was attached to the Company and placed in its center. The Company continued the march.

SOLUTION TO REQUIREMENT NO. 6

Under the protection of the dismounted infantry, the battery was silenced by a few well aimed shots of our infantry guns. One of our guns directed its fire on the village of Fresnes which was strongly occupied, and from which a hostile company emerged on a counterattack mission. A platoon of the company effectively supported by the guns (self-propelled) pushed the enemy back, thus enabling the company to gain the heights and prepare for defense.

SOLUTION TO REQUIREMENT NO. 7

The armored train was sent back, weakly manned as ordered. The leader of this column, acting quickly and decisively, eliminated a machine gun nest, which in the meantime had taken up a position to the rear between Estrees-Deniecourt and Berny-en-Santerre. An attack of strong enemy forces, consisting of two companies and supported by several tanks which appeared from Marchelepot, was repulsed with the aid of the battery (self-propelled). The attackers were almost completely wiped out by the fire of the artillery, the machine guns, the infantry howitzers, and the other heavy weapons. Those left were taken prisoner and removed to the rear. During this engagement, we succeeded in reestablishing contact with our tanks which were approximately one mile to the south. The reconnaissance troop having reported the village Ablaincourt to be occupied by the enemy, the village was covered with fire from our infantry guns and the unit of heavy weapons with such effect that the intended counterattack was prevented. One hour having meanwhile elapsed, our armored train now returned loaded with the men of the Second Company. They had hardly arrived in the area of the *support point* when four or five enemy tanks appeared and attacked from the direction of Marchelepot. The fire of our artillery meeting them, the enemy suddenly swung about and disappeared southeast towards Marchelepot. This attack of the enemy was supported by four bombers and several Morane fighters which attacked our support point from an extremely low altitude, setting one of our battery ammunition trucks on fire with bombs.

Thus an outstanding success was achieved by the establishment of a strong *support point* in the rear of the enemy, without serious loss. This achievement was mainly due to the exemplary coordination of the artillery section and the battery which joined the company en route.

EDITOR'S NOTES—

(By Lieutenant Colonel James C. Crockett) :

This problem and its solution suggests the following notes:

1. The armored infantry is held immediately available for support of tank action.

2. The combined arms are often attached to the smallest infantry units.

3. The immediate attachment of separate units to form a battle group of combined arms.

4. *Support points* are established to give security to the tank units.

5. These *support points* are established deep in enemy territory by what we may call unit infiltration.

6. The *support points* are strong terrain localities.

7. Units moving to establish the *support points* avoid local combat depending on mopping up operations to clear rear areas after the *support points* are strongly held.

8. The units initially establishing the *support point* are highly mobile. Impedimenta which interfere with the mobility are left behind until the areas are strongly held by combined arms.

9. Armored troop carriers are used in moving through the battle areas to the new established *supporting point.*

10. Radio communication at first bridges the battle area between *supporting point* and base of infiltrating units.

11. The new technique of maintaining a mobile battle front as claimed by the Germans is accomplished by the following steps.

(a) Front is penetrated by driving several armored columns deep into the position.

(b) In the wake of these penetrations *support points* are immediately built up by infiltrating armored units of the combined arms. The infiltrating units attempt to avoid combat until their arrival in the *support point* area.

(c) Having established firmly these *defensive support points* they are used as a base of further operations by the armored units.

(d) The elements of enemy resistance left behind are now mopped up by oncoming units, or by elements of the *supporting points.*

Cavalry Regiment (Horse and Mechanized)

By
LIEUTENANT COLONEL CHARLES F. HOUGHTON, *Cavalry*

Each type army corps contains one cavalry regiment (horse and mechanized) which is essentially for ground reconnaissance and not for close and sustained combat.

The purpose of this regiment is to provide, within the corps, a cavalry unit with both tactical and strategical mobility which is capable of performing continuous both distant and close ground reconnaissance for the corps.

The regiment is organized as follows:

Regimental headquarters and band
Headquarters troop—13 radios
Troop headquarters (2 radios)
Regtl staff section (4 radios)
Communication platoon (2 radios)
Pioneer and demolition platoon (3 squads) (1 radio)
Antitank platoon (6—37-mm AT guns) (4 radios)
Service troop—11 radios
Troop headquarters (1 radio)
Regtl supply section (1 radio)
Transportation platoon (1 radio)
Portee platoon (for 1st Sq) (7 radios)
Regtl motor maintenance platoon (1 radio)
1st Squadron, Horse—4 radios
Squadron headquarters
Headquarters section
Communication section (4 radios)
Caliber .50 MG platoon (4MG)
Three rifle troops (A-B-C)
Troop headquarters
Three rifle platoons (31—M1 rifles each) (3 squads)
One light machine-gun platoon (6—LMG) (3 squads)
(74 truck-tractors with semi-trailers to transport this entire squadron are included in the Portee Platoon of the Service Troop).
2nd Squadron, Mechanized—48 radios
Squadron headquarters—(2 radios)
Two reconnaissance troops (E-F) (20 radios each)
Troop headquarters (4 radios)
Four platoons, each of
Two sections of two s.cars
4 s.cars, 4 solo motorcycles, 4 radios
Each scout car is armed with: 2 caliber .30 heavy (water cooled) machine guns, a caliber .50 machine gun and a caliber .45 sub-machine gun.
One motorcycle troop (G) (6 radios)
Troop headquarters (2 radios)
Four platoons, each of
Two sections of two squads
1 s.car, 7 solo motorcycles, 8 motor tricycles, 1 radio
Each motorcycle or motor tricycle is armed with a caliber .45 sub-machine gun.
Attached medical
Headquarters section
1st Squadron section
2nd Squadron section
Veterinary section
Attached chaplain

This regiment has the characteristics both of horse cavalry and of mechanized reconnaissance units. Taken as a whole, it has high strategical and tactical mobility, heavy automatic fire power, and ability to reconnoiter continuously in any type of terrain and in any kind of weather.

The *horse squadron* has high battle field mobility in all types of terrain and in all kinds of weather. When porteed, it has a high strategic mobility but, in portee, is vulnerable to attacks from the air and ground.

This squadron is capable of close, continuous and detailed tactical reconnaissance and can furnish moving or stationary counterreconnaissance screens commensurate with its strength.

The mechanized squadron has the characteristics of high road speed, light armor, heavy automatic fire power, and has great strategical and tactical mobility when employed in terrain with a good road net.

Scout cars have limited cross-country mobility even in good terrain and therefore are essentially road and not cross-country vehicles. At night, without lights, they should stay on roads and can move at not to exceed 10 miles per hour.

At night scout cars should be withdrawn in rear of the outpost line for rest and maintenance.

From both the reconnaissance car and motorcycle troops dismounted patrols may be employed at night. These are usually standing patrols.

Scout cars are lightly armored against small arms fire. They are vulnerable to all antitank weapons. The cars have open tops and are subject to attack by air, grenades, and all weapons employing high angle fires. The tires of the cars are puncture sealing.

The headquarters troop, in addition to staff and communication sections, contains:

J. J. Gregor, Fort Bliss, Tex.
LIGHT MACHINE-GUN PLATOON IN PACK

—*Cavalry Journal*

PORTEE EQUIPMENT FOR THE HORSE SQUADRON

An *antitank* platoon with 6 37-mm antitank guns towed by six scout cars.

A *pioneer and demolitions* platoon of three squads transported in four scout cars and four ½-ton pickup trucks. This platoon has the same equipment as a combat engineer platoon of the same number of squads.

Each scout car is armed with: 2 caliber .30 heavy machine guns, 1 caliber .50 machine gun, and 1 caliber .45 machine gun. Each motorcycle or motor tricycle is armed with 1 caliber .45 submachine gun.

For train defense every four trucks are armed with three caliber .30 light machine guns and one caliber .50 machine gun.

The total armament of the regiment is quite impressive. There are 110 caliber .30 machine guns (air-cooled), 136 caliber .30 heavy machine guns (water-cooled), 99 caliber .50 machine guns, 243 caliber .45 sub-machine guns, 6 37-mm AT guns, 1530 pistols and 532 M1 rifles.

The missions assigned this regiment by corps commanders should be appropriate to the mobility, strength, armament and equipment of the unit.

The basic War Department doctrine is as follows: "These mechanized reconnaissance units should be employed to capitalize their characteristics by extending the range and speed of ground *reconnaissance* of their respective echelons, generally avoiding combat unless necessary to secure vital information."

The current revision of FM 100-5 (FSR—Operations) in paragraph 45 gives the following missions for this corps cavalry regiment: "Its primary mission is continuous ground *reconnaissance*. It may be used for any suitable cavalry mission. It should be reinforced when serious combat is anticipated."

Paragraph 44 of the same document states: "Mechanized reconnaissance units are pushed well forward and to the flanks. They may be reinforced by armored or motorized units, heavy in fire power, in order to delay or block hostile armored or motorized threats."

In general, if combat other than reconnaissance (such as delaying action or seizing and holding an advance position) is contemplated, this regiment should be reinforced by motorized artillery, infantry and engineers. It may always be given a secondary reconnaissance mission even though security is the primary mission.

In most cases when the corps advances, the regiment should be employed under *corps* control in order to reconnoiter from a *corps* viewpoint. For this reason it rarely should be assigned any permanent place in a column or attached to a division by the corps.

If the corps sends forward a division as a strategic advance guard or employs a division as a flank or rear guard, the regiment or a detachment of it may be attached as a reconnaissance element.

Whenever more than one mission is assigned, the corps commander should state the priority of the missions.

Missions should be definite. The regiment should be told WHAT action is wanted, WHEN it is wanted and WHERE it is wanted. In no case should the regimental commander be told HOW to accomplish his mission. The corps commander should, if necessary for clarity, tell the regimental commander WHY he is to accomplish certain things.

Reconnaissance.—Continuous ground reconnaissance is usually the primary mission of the regiment. Specific missions should be assigned which are a part of the intelligence plan of the corps and should include:

WHAT specific information is desired? (Red strength, composition, movements, dispositions, location of leading or flank units, nature of terrain, resources of the theater of operations or location of our own troops).

Bradford Kress, Lake Charles, La.

MOTORCYCLIST IN ACTION

WHERE is the objective? Is it a particular Red force, a zone, an area, a route, or a terrain objective (hill-town-crossroads-bridge)?

WHEN must the desired information be sent in? To be of any value it must arrive in time to be of use. This means that these reconnaissance missions must be anticipated well in advance and the unit sent on reconnaissance in time for it to move to the objective, reconnoiter it, and report the information to corps.

In many moving situations the corps should send forward an advance message center close to or even at the regimental command post. There should be an assistant G-2 at the advance message center who can evaluate information as it is received from the numerous cavalry patrols. The advance message center should be in communication with the corps command post by wire, radio and motorcycle messenger.

Missions of the corps cavalry and observation aviation must be closely coordinated by G-2 and G-3 before the operation commences. The planes of the corps observation aviation should work directly with the regimental command car and communicate to it all pertinent information. The cavalry should request the air corps to observe and report on any special point or area. The regiment, based on early information from the observation aviation as to the general location of the enemy mass, moves rapidly to establish contact on a broad front. Both enemy flanks are sought out and observed. *Contact once made is maintained continuously.* Usually the regiment will be the first unit of the corps to make ground contact with the enemy. This fact should always be reported at once to the corps command post.

Reconnaissance capabilities of the regiment are quite extensive. The Mechanized Squadron can cover a zone 30 to 50 miles wide depending on the number of main roads available. The Horse Squadron can cover a zone of at least 10 miles wide.

In general, the Mechanized Squadron should be used in open terrain or for distant reconnaissance; and the Horse Squadron for close and battle reconnaissance or in close or wooded terrain.

The Horse Squadron can procure more reliable information in bad weather, at night, and in close terrain than the Mechanized Squadron.

A scout car platoon can reconnoiter a zone from 8 to10 miles wide along one main highway. If a very thorough and detailed examination of the terrain is necessary the platoon can advance from 5-15 m.p.h. through this zone in daylight. This of course depends on the number of side roads, towns and woods in the zone. Hence the width of zone assigned the scout car troop should rarely exceed 30 miles (front for three platoons only), and the zone assigned the 2d Squadron should rarely exceed 50-60 miles (front for two scout car troops).

Scout car platoons operate by the "sneak and peek" method and avoid combat unless absolutely necessary. A "dog fight" with the hostile reconnaissance vehicles should be avoided.

A scout car platoon or even an entire troop may be used as a covering force to protect the personal reconnaissance of the corps commander.

As a minimum the regiment should always be able to locate definitely the contour of the most advanced hostile elements and also the hostile flanks.

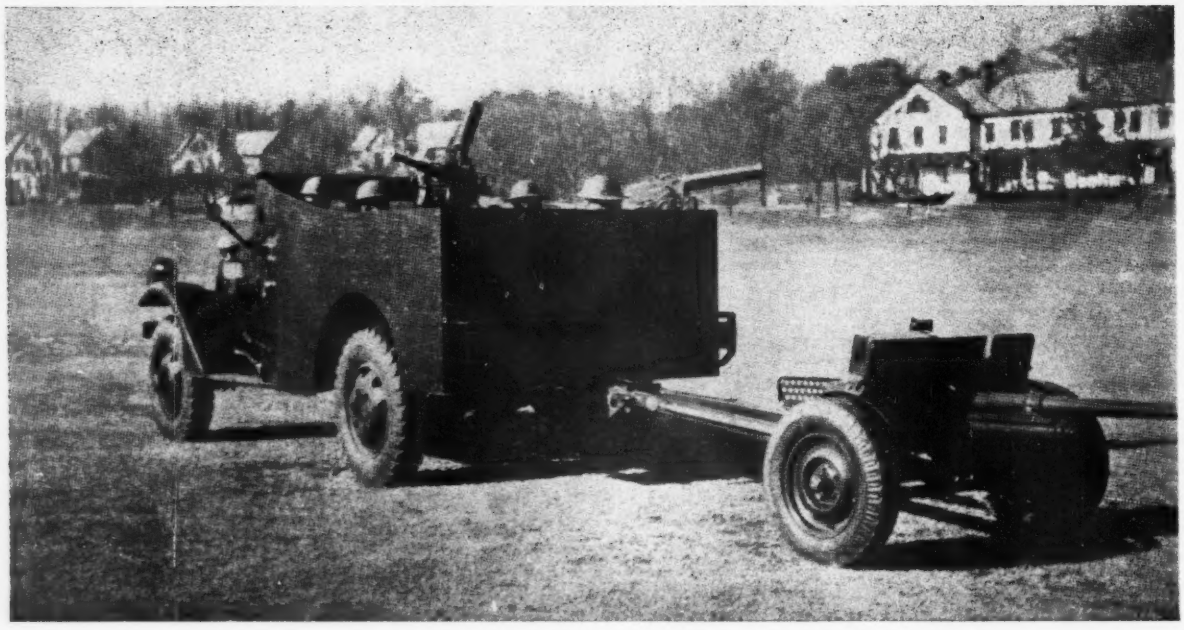
In many situations both horse and mechanized reconnaissance will be necessary in the same zone or area. This may be accomplished by the employment of *reconnaissance teams,* composed of necessary horse, scout car and motorcycle elements.

Operations on two flanks.—After the regiment is relieved by infantry on the front of the corps, the bulk of the regiment may be employed on one flank of the corps with a troop or a reconnaissance team on the opposite flank. In this case the regiment and the troop or team should each operate directly under corps control. To do otherwise would slow down materially the transmission of information to corps headquarters.

Many security missions may be accomplished by the regiment. In all cases, however, the corps commander must decide whether security is more important than the reconnaissance for which the regiment is primarily intended.

—*Army Ordnance*

CAVALRY SCOUT CAR



—*Cavalry Journal*

ANTITANK SQUAD

Usually it is not. G-2 and G-3 must work in close cooperation in assigning this type of mission to the regiment.

This regiment has a large amount of mobile fire power and is capable of executing a strong delaying action. In many cases when such a mission is assigned, it will be necessary to reinforce the regiment with motorized infantry, artillery, engineers, etc., to have a force strong enough to accomplish the security mission. This force should operate under the commander of the Horse and Mechanized Regiment.

When the corps is seriously threatened and a stronger general security detachment is required, usually it is best for corps to organize a motorized detachment of all arms and attach all or part of the regiment to this force as its *reconnaissance* element.

The regiment is able to furnish either stationary or moving counterreconnaissance screens on a limited front. During an advance by the corps, the primary mission of the regiment is reconnaissance well to the front and flanks. Speed of advance and close cooperation with the corps observation aviation will be necessary.

The regiment itself lacks offensive power. The Horse Squadron and the motorcycle troop may attack but they do not have as much power as a battalion of infantry. Close combat generally should be avoided.

When a flank corps attacks, the primary mission for the Horse-Mechanized regiment should be reconnaissance of the enemy flank and rear. The Horse Squadron may be employed to screen the advance and deployment of the flank division prior to the attack. An interior corps may hold the regiment as a mobile reserve after battle is joined, to protect its rear or Army may give it a special mission.

In a pursuit the regiment may be strongly reinforced with troops of all arms and employed as a mobile encircling force. On the other hand the regiment may be attached to a large mobile encircling force for a reconnaissance unit.

The regiment with its large volume automatic fire may be employed to execute harassing attacks by fire against the hostile flanks and rear.

The regiment has heavy fire power but it should not be expended in the defense of a position, except as a last resort. When the corps defends, this unit should be employed on reconnaissance well to the front and flanks to report the location and movement of the hostile mass. It may be employed as a mobile covering force in front or on the flanks of the corps.

To summarize.—The Cavalry Regiment (Horse and Mechanized) is in existence to execute two missions. *The Primary Mission is reconnaissance for the Corps.* The Secondary Mission is security of the Corps in bivouac. on the march and in combat.

Discipline "New Style" in the German Army

BY
LIEUTENANT COLONEL W. A. COPTHORNE,
Chemical Warfare Service

The notorious Prussian discipline of the German Army prior to the elose of World War I, has gone into the discard, along with stabilized trench warfare and those outmoded means and methods that fail to fit in with modern streamlined wars.

Although outwardly it may appear the same, the new German discipline has been based on the soundest of all principles for cooperative effort—discipline through perfected leadership. It is derived from mutual self-respect and confidence between the leader and his men.

The development of leadership begins with the noncommissioned officers and junior officers. It does not mean "generalship" nor leading by supreme commanders in the field. It begins with the squad leader and goes through each successive group. In this sense leadership tends to make an army composed of units—each one of which is effective in itself.

Germany has evaluated her strength and her weaknesses, as disclosed by World War I, as well as the strong points of her enemies. These have been studied and the features of strength have been exploited to the maximum, while elements of weakness have been discarded.

The fact that cold, brutal Prussian discipline made an insecure foundation for morale has been recognized. It has likewise been conceded that that type of discipline may have had no small part in the defeat of Germany.

Strangely enough, modern German discipline is based on the most democratic principles. The requirement of military service is universal and there is no preferment for an individual because of profession, trade or state of finances. There is no distinct officer class as in the former days of Prussianism. The basis of Prussian discipline was fear, and it was attempted to secure automatically the correct action of each individual in battle by precision drills and constant repetition.

It has been recognized that the inspiration of a real leader can carry a man farther in battle than can any form of compulsion. A man who is driven by fear and compulsion will always give forth less than 100% of that of which he is capable. But a leader who inspires his men to enthusiasm, recognizes each man's individuality and instills in him a sense of superiority and confidence, can bring forth the 100% effort of which that man is capable.

The methods of developing noncommissioned officers and officers of company grade lend themselves fully to the new idea. Each has experienced an apprenticeship in the Labor Service. Each has undergone the two-year military training course which is available to men in the ranks, and has been selected because of his special aptitude for leadership.

The background of the junior leaders, therefore, enables them to have a sympathetic understanding of the problems that confront their men. These men in turn are more closely bound in their loyalty since they know their leaders have qualified in the school of the conscript, an opportunity that was open to all.

The effectiveness of the new discipline has been demonstrated. The morale of the German Army has been high and observers agree that this high morale and the astounding successes have had their basis in the superb leadership of line officers.

Examples of the new discipline are noted in reports which tell of junior officers taking off their coats and working with their men in moving stalled vehicles and clearing the way. The most startling changes have been noted in the relation of comradeship existing between officers of all ranks and enlisted men. It is a common sight for an officer of considerable rank to enter a restaurant and dine at the same table with his chauffeur. Frequently a soldier may approach a table occupied by officers and ask if he may sit down. He then joins freely in the conversation. These instances could not have occurred in the old German Army, nor is it general in any other army today.

While the foregoing comments are applicable to the German Army in general, discipline shows considerable variation depending upon the locality from which the troops were drawn. That of the Austrians was notably less than in units from Bavaria, while Prussian troops excelled. It is reported that Austrian officers disapproved of the employment of their men in the most dangerous operations. Austrian troops in Norway protested their unwillingness to be used in an invasion of Great Britain, bringing severe disciplinary action upon themselves.

Isolated serious infractions of discipline and crime occur in the German Army as in all armies, but principally in the newly occupied territories. These are met with severe measures of repression. In one case soldiers accused of looting were handcuffed and marched through the town, probably for the purpose of impressing the civilian population with Germany's high sense of justice.

Many incidences of serious lapses in discipline might be quoted but these cannot be used as a basis for evaluating the general state of order in the army. Probably the most enlightening index is the rate of AWOL and desertion. These have been remarkably low, which may be attributed to the basic principles underlying the development of discipline and morale.

These principles include the development of professional pride in military performance, a sense of honor in the privilege of serving his country under arms, and the elimination of those duties which might tend to degrade the man in uniform, such as excessive fatigue and other non-military duties. The successful inculcation upon the soldier of this attitude toward his military service tends to control him under a self-imposed discipline. Such self-regulation is more effective than any imposed upon him from an external source.

Until the inauguration of hostilities against Russia, there was nothing to put German discipline to a real test. High morale was maintained by continuous and relatively easy victories in battles of short duration. However, the Russian campaign, involving long marches under many adverse conditions, and an unexpected opposition, is putting German morale and discipline to a supreme test. German discipline should stand that test, since it is based on principles that are believed to be sound for the development of large modern armies.

A Tank Platoon in Battle Against a Hostile Tank Platoon

BY

LIEUTENANT COLONEL V. W. B. WALES, *Cavalry*

In the accounts that have been, and are being, received from European battlefields there is but little information on the combat of tank forces of approximately equal strength.

Undoubtedly many lessons on this subject will be learned from the German invasion in Russia but it will take considerable time for the reports to be received and to evaluate the information contained in them. In the meantime we must prepare ourselves for active participation in battle and we cannot wait.

All forces employ the principles of fire and movement in the attack but those forces with low relative mobility cannot apply them as speedily as those capable of more rapid maneuver. Time is one of the most vital elements in modern war. An attack by slow-moving foot troops affords the enemy time for counter moves and therefore the attack has to add power to make up for the loss of time. This was the basic reason for the failure of both the Allies and the Central Powers to make a complete breakthrough in the hostile lines in the first World War. On the other hand rapidly moving forces, having time in their favor, do not need so much power for effective operations. This is the basic reason for the German success in the present war with their "stabbing tactics", or the use of small mobile units to "feel out" the weak points in the enemy position.

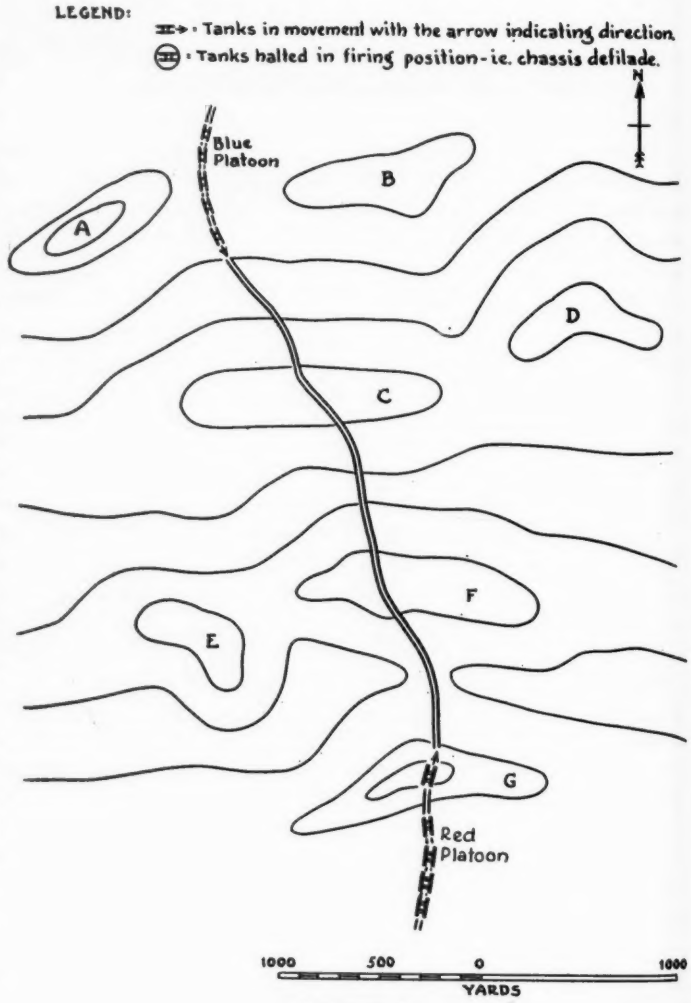
Suppose we apply these ideas to the combat of a five tank platoon against an equal enemy force so as to bring out more fully the principles of rapid combat, how fire superiority can be obtained initially, and how it can be maintained until the enemy platoon is defeated and destroyed or driven from the field.

In order not to bring in a great many confusing factors such as relative reconnaissance, doctrines, leadership, morale, etc.; we will confine this to a discussion of the mechanics only. We assume that each platoon has full information about the other.

For our purposes suppose we consider the relative disposition of the two platoons as shown in Sketch No. 1.

If both continue the march rapidly, time and space factors indicate that the Blue Platoon will reach hill C, at the same time as the Red Platoon will reach hill F, and no initial advantage will accrue to either platoon. In this case the actual combat phase will start upon reaching the hills mentioned.

If one platoon can find some means to delay the other so that, for example, the Blue Platoon can reach hill F while the Red Platoon is still on hill G there is still no particular advantage for either platoon. On the other hand, if the Blue Platoon can reach hill F and catch the Red Platoon moving in



SKETCH 1

the open between hills F and G or if the Blue Platoon can reach hill C, deploy and open fire on the Red Platoon moving between hills C and F, it will have a great advantage for the following reasons:

1. The Blue Platoon being halted will be able to deliver accurate fire while the Red Platoon's fire will be very inaccurate due to the pitching of the vehicles while in movement. (While I know of no figures on this, I believe from my own experience that the relative accuracy would be at least 5 to 1.)

2. Only the turrets of the Blue Platoon tanks would be visible and the bodies would be protected by the hill to the front while the vehicles of the Red Platoon would be fully

exposed. This would give another advantage to the Blue Platoon of about 5 to 1 (by estimation). Combining this with 1, above, we get an advantage of 25 to 1.

3. On the other hand it is difficult to hit a moving target so this fact will reduce the fire effect of the Blue Platoon over the Red Platoon to about 5 to 1. (Note: I take this factor of 5, which is at best only an educated guess, because we are dealing with platoons of 5 tanks each and it will eliminate fractions.) In other words, the firepower of one tank in position will be about equal to five tanks moving within range in the open.

Now this superiority in fire is still enormous so we can deduce the first idea for our solution which is "In the combat of a tank platon vs a tank platoon the platoon commander maneuvers his platoon so as to reach a position with chassis defilade from which fire can be delivered within effective range on the hostile platoon, while it is in the open." This will not be easy as the opposing platoon commander will probably be seeking a similar advantage. If he is caught in the open he will seek cover and in case there is none, he will probably retire to a position from which he can attack to greater advantage. However, during the short time he is caught under accurate, effective fire he should suffer some loss. Even if it is only one tank he is reduced in relative combat power in the ratio of 4 to 5. Prompt attack and pursuit will result in his defeat.

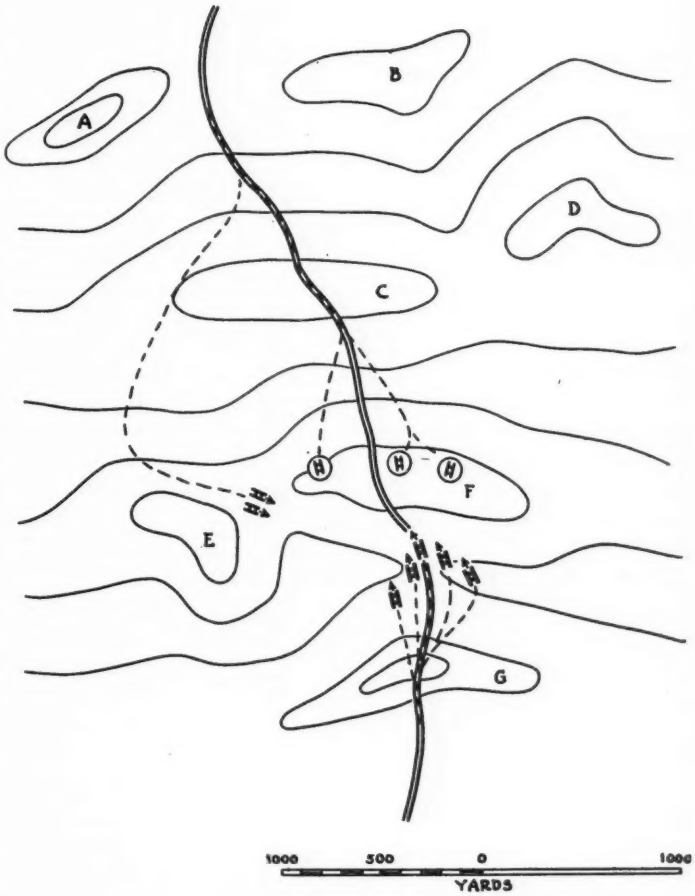
This brings us to our second major consideration which is "The platoon leader seeks to use the mobility of his tanks to get an early advantage over his enemy." Now suppose the Blue Platoon commander, making a quick personal reconnaissance from hill A, sees that the terrain to the south consists generally of a series of ridges running east and west. He observes that the Red Platoon is moving rapidly to the north on the road. Estimating time and space he sees that he can reach hill C with some of his tanks in time to catch the platoon in the open between hills C and F. Due to the great fire superiority of tanks in position over those caught moving in the open he can estimate that if he puts two tanks on hill C they will be able to establish a 2 to 1 fire superiority over the Red Platoon if the latter moves north of hill F. This releases two other tanks and his own tank for maneuver. If he moves some of his tanks promptly and secretly to a position on the flank of the Red Platoon and opens fire an additional advantage will be obtained because:

1. Surprise flanking fire combined with frontal fire creates a powerful moral as well as material effect. Let me quote from our *Field Service Regulations, Operations,* May 22, 1941, FM 100-5, paragraph 537, page 121 which states, in part; "Fire effect is increased by enfilade action. Flanking or oblique fire is especially effective when frontal fire is delivered simultaneously against the same objective. A convergent fire forces the enemy to defend himself against attacks from several directions and creates a powerful moral as well as material effect." If this flanking fire enters the picture as a complete surprise to the enemy it is doubly effective.

2. The side of a tank presents a better target than the front and is more vulnerable to fire than the front due, in part, to the fact that frontal armor is more efficient than that on the sides and that a larger and more vulnerable target is presented from the side.

3. The maneuvering tanks can choose a position with chassis defilade whereas the tanks caught in flank may be fully exposed. (See Sketch No. 2.)

A third main point is the skill with which the tanks are used both individually and collectively. As far as Lt. "A," comanding the Blue Tank Platoon, and Lt. "B," commanding the Red Platoon, are concerned, this skill comes only from a sound knowledge of minor tactics and technique and of the capabilities and limitations of their weapons. This results from instruction and training but even if both have enjoyed the same opportunities, there is still bound to be a difference in their leadership which results from personal bravery, aggressiveness, and other traits of character that cannot be molded to any great extent by education. Consequently, let us assume that Lt. "A" is very aggressive while Lt "B" is more cautious and makes up his mind more slowly.



SKETCH 2

From his OP on hill A, Lt. "A" sees Lt. "B's" tank on hill G. He also sees the terrain to the south. We have assumed that he knows the rest of the situation. Being aggressive, his mental estimate of the situation results in an immediate decision to send two tanks rapidly to hill F by way of the road and across country with instruction to seize it before the Red Platoon can reach it. He also sends two tanks across country by way of hill E to attack the Red Platoon in flank and directs his own tank to a location between the two groups as a reserve. All tanks act aggressively, moving rapidly to positions in chassis defilade from which they can fire on the enemy within effective range.

Lt. "A" directs his two enveloping tanks to move by the shortest concealed route to their attack positions as he knows the enemy has equal mobility and he does not want to run the risk of being defeated in detail.

Suppose that in the above maneuver Lt. "B" decides at the same time to make a quick dash for hill C. In this case he would arrive on hill F about the same time as three tanks of Lt. "A's" platoon reach hill C, and two other of Lt. "A's" platoon reach the West end of hill C. Neither platoon in this event has any marked advantage.

This illustration brings us to our third idea which is "The skillful use of tanks depends on full utilization of their general mobility." Speed and maneuverability are capabilities of tanks just as much as armor and firepower. To fail to use them reduces the effectiveness of tanks materially.

Suppose the terrain had been as shown in sketch No. 3. In this case Lt. "A" observing from hill A would see that an envelopment of the hostile east flank would be much more liable to succeed than an envelopment of the hostile west flank because:

1. His enveloping tanks would have a concealed route of advance and hence would not be subject to observation or fire.

2. By opening fire suddenly on the flank of the enemy platoon the enveloping force would have the advantage of surprise which is of vital importance.

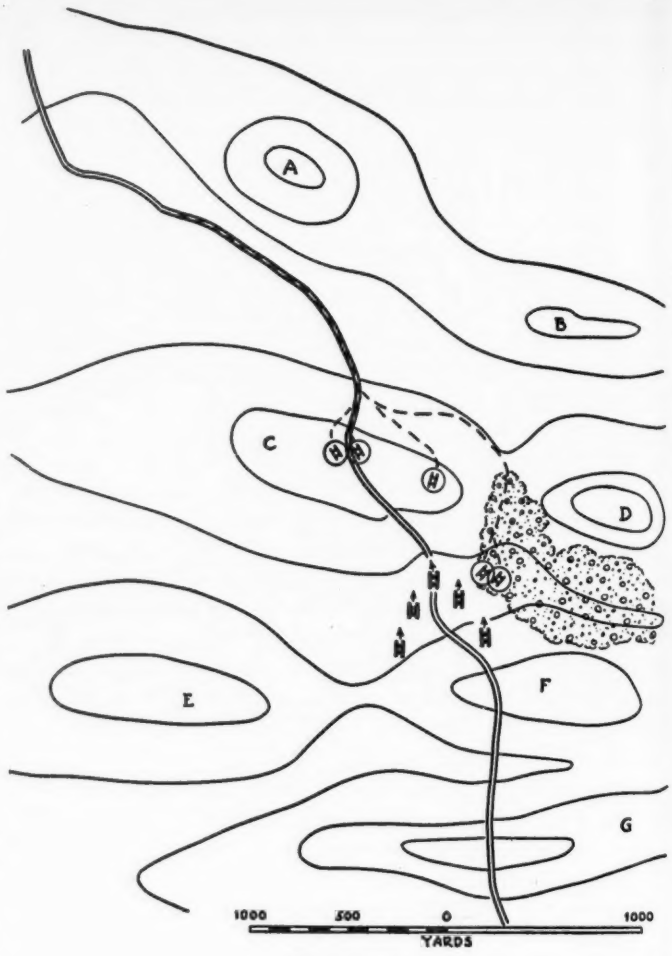
This illustrates our fourth main point in the solution which may be expressed, "Tank forces utilize the terrain to their own advantage and to the enemy's disadvantage."

By this time it is apparent that the theory and practice of tank tactics is identical with that of any other arm. The only difference is in technique which follows logically from consideration of the *relative* capabilities and limitations of the tanks. If a tank can move across good terrain at 15 miles per hour and an infantryman can move at 1½ miles an hour then the tank moves at ten times the speed of the man on foot. All the factors that depend on speed, such as maneuver, may therefore be up to ten times as great. Time is in indirect ratio to speed hence those factors which depend on time such as surprise, distance covered, etc. will be greatly in favor of the tank.

In the case of tank versus tank, however, the relative factors are equal so that, where tanks can safely take liberties against slower moving organizations, they cannot do so against equal tank forces. When tanks meet tanks they must employ the identical tactics and technique that have been developed by the infantry, cavalry, and other arms and services because relatively they are equal and victory will come only to the commander who fights his tanks with the most skill.

For convenience, suppose we tabulate some of the main points that the infantry squad uses in battle to show how tanks are employed in an identical manner when engaged against an equal tank force.

INFANTRY SQUAD VS INFANTRY SQUAD	TANK PLATOON VS TANK PLATOON
When combat is imminent	
Extra ammunition is issued, weapons checked, men are fed and all other details checked.	Vehicles are serviced, weapons checked, men fed and all other details checked.



SKETCH 3

Upon contact	
The squad leader makes a hasty reconnaissance, an estimate of the situation and a decision to attack by fire and movement.	The platoon leader makes a hasty reconnaissance, an estimate of the situation and a decision to attack by fire and movement.
Maneuver	
The squad leader attacks by establishing superiority of fire and by an enveloping attack in order to bring flanking as well as frontal fire on the enemy.	The platoon leader attacks by establishing superiority of fire and by an enveloping attack in order to bring flanking as well as frontal fire on the enemy.
Advance	
The squad advances rapidly using the terrain to their own advantage and to the enemy's disadvantage. It advances by rushes or infiltration. Superiority of firepower is maintained. Flanking groups close in on the enemy in a similar manner.	The platoon advances rapidly using the terrain to their own advantage and to the enemy's disadvantage. It advances by rushes or infiltration. Superiority of firepower is maintained. Flanking groups close in on the enemy in a similar manner.
Assault	
When the squad arrives close to the enemy, bayonets are fixed and at the psychological moment the squad attacks with the bayonet to destroy him.	When the platoon arrives close to the enemy and at the psychological moment it assaults to increase the penetrative effect of fire and the volume of hits by decreasing the range. Only in grave emergencies is the actual crash of tank vs tank justified.

Some qualifying factors

Infantrymen are subject to bodily fatigue. They move slowly on foot. Any projectile or mine will put an infantryman out of action.	The tank is not subject to fatigue but it may have mechanical failures. The tank is relatively fast. Usually it takes a direct hit by an armor-piercing projectile in a vulnerable spot to disable a tank. They may be immobilized by mine fields and may have casualties from air attack using the heavier bombs.
Infantry can fight on practically every type of terrain and in every climatic condition.	Some terrain is difficult or impassable for tanks and excessive rain or snow may seriously impair the mobility of tanks.
Infantry can hold ground.	Tanks have only a temporary holding power.
It takes the infantry with cold steel to drive an enemy out of his trenches—you cannot shoot him out.	Tanks depend on firepower and crushing effect for their destructive effect. It is difficult for them to force a determined enemy out of his trenches.

In case the terrain features do not provide positions for chassis defilade, concealment and cover, the platoon commander establishes fire superiority at the limit of effective range by halting to take advantage of accuracy of fire. As soon as this superiority is obtained the attack is continued by fire and movement; superior firepower providing cover for the advance. Practically all terrain will furnish considerable cover if used skillfully so this situation will seldom arise. If it does, however, the situation will dictate whether or not combat should be offered on that particular area or the action staged on more favorable terrain by utilizing the power of maneuver. In case the hostile armor is superior the attacking tanks must close on the enemy tanks until effective range is reached. Individual tanks while advancing move by zig-zag routes to make a difficult target for the enemy.

The above remarks are rudimentary but the proper conception of minor tank tactics is extremely important. Many accounts of the war in Europe prove that the tactics of small Allied tank units were very poor and those of the Germans were subject to improvement in some cases. The Germans were so superior to the Allies, however, that their mistakes were not noticeable.

I would like to conclude this with two thoughts:

1. No two tactical situations are ever identical. It is therefore impossible to solve them the same way. You cannot substitute memory for analysis.

2. If small units are successful on the battle field the success of the larger units is assured. When the large units are successful the war is over.

"These new tactics, written in blood, do not mean the end of the infantryman. Far from it. The infantryman, no matter how transported, is and will remain a highly important element of land warfare. He holds ground and takes it. It is he who must complete and often initiate the rout of enemy armies. The superb, 40-mile marches of the German infantry during the Blitzkrieg in the west, the infantryman's full complement of weapons (he is now a walking arsenal), his initiative, intelligence, and training were important factors in the German victory. . . ."

United We Stand!—Hanson W. Baldwin.

Antimechanized Defense

By
Lieutenant Colonel Charles A. Pyle, *Field Artillery*

"There ain't no holt what can't be broke."

Can the armored attack be stopped? It is desirable in a discussion of how to accomplish a given task to go back to similar cases in history and find how it has been done successfully in the past. This basis does not exist in evolving a scheme of antimechanized defense. The offensive power of armored forces has been and is being demonstrated in Europe and Africa. *An effective defense* against the armored attack has yet to be clearly demonstrated. Examples of defense against armored units in recent battles are confusing, contradictory and lacking in essential details.

The backbone of an armored force is the tank—a land battleship combining protection against shell fragments and small-arms fire. The trend appears to be toward heavier tanks carrying sufficient armor to protect against projectiles up to 40-mm. The tank has considerable cross-country mobility and great fire power but provides limited visibility. The accuracy of fire from a tank while moving is quite limited although the addition of stabilizers may overcome this difficulty.

Tanks may be used in various ways. A group may be used in a limited objective attack or counterattack in close support of infantry or they may be combined with engineers, artillery, infantry and air support units into a well coordinated unit—an armored force. The latter is the most difficult to combat. Any defense that proves effective against the attack of an armored force will be effective against the lesser threat.

An armored attack will be preceded by extensive mechanized reconnaissance on a broad front—probing tentacles seeking out weak spots in the defense. The attack will be preceded usually by a bombardment of the position with infantry weapons, artillery, air units, everything the attacker can muster to destroy or neutralize the defender's weapons.

A workable system of antimechanized defense must consist of (1) an adequate warning system; (2) utilization of barriers and obstacles to the maximum; (3) aggressive use of antitank guns against the attacking mass.

The importance of an effective warning system is paramount. The primary means of communication must be radio. All units are trained to report immediately the location and movement of hostile mechanized units. In the triangular division, the air service, the reconnaissance troop, the division AT warning net and higher headquarters will be the more important agencies.

The air service in many situations will be our most important means. In general, it should keep us informed of the location, size and movement of large armored forces while still deep within the hostile line. However, our air observation may be prevented from operating by fog, rain, snow or hostile air action. Opposing forces will certainly make every attempt to achieve air dominance in the particular area selected for their attack. In many situations they will be able to do so. We can *count* on being informed of an armored attack only when the hostile tanks can be seen or heard from our ground observation posts.

The antitank warning net should consist at the minimum of a radio set at each infantry and artillery regiment, each infantry antitank company, each artillery battalion observation post and each location of the division mobile antitank reserve. All these stations should operate on the same frequency. This will result in a much larger net than has been usual heretofore and will necessitate perfect radio discipline. All stations listen until they have information concerning a tank or air threat to report. When such a threat appears a prompt report is made to division headquarters but since all other stations in the net are guarding the same frequency this has the effect of broadcasting the warning to all units.

The extent to which barriers may be used depends largely on the time available. The use of barriers must be closely coordinated by higher units to prevent undue interference with the maneuver of friendly forces. The general plan should be worked out for the theater of operations as a whole rather than by lower units. Barriers should extend in depth up to fifty or one hundred miles. Lower units extend the general plan to provide for local protection when time permits.

The tactics of antitank gun defense follow the old principle that where the attacker maintains a mobile reserve with freedom of action, the defender must maintain also a mobile reserve capable of meeting the hostile mass. Since the hostile armored force will attack in mass on a narrow front and in great depth, the bulk of antitank guns initially should be held mobile in reserve until the direction of the hostile main threat is known. Only the minimum number of guns is put in position as a forward defense to slow down the attack and give time for the movement of our own antitank guns to meet the threat.

Information available from Europe and Africa indicates that the antitank gun has been the superior of the tank where they have met on equal terms. Of course, four or five antitank guns cannot hold off an attack of fifty or sixty tanks but it seems that a given number of antitank guns can hold off three or four times their number in tanks. Several examples have been reported where single antitank guns have done much better. However, the square division with its present organic armament cannot stop an attack of an armored division. Of the 48 guns assigned to infantry regiments only those on the front of the attack will see action. The division usually will be able to meet the attack only with 16 75-mm guns and about 40 37-mm guns. Unless aided by obstacles and terrain unsuited for tanks, the 50 or 60 guns available can scarcely hope to stop 400 or 500 tanks. To accomplish this, the division should be reinforced by two antitank battalions. The total antitank guns then available to meet the attack would be approximately 120. However, it is unnecessary and undesirable that the organic antitank gun strength of the division be greatly increased. To do so would needlessly encumber the division with weapons which in many cases would be useless. Antitank battalions should instead be held mobile by higher headquarters available for reinforcing those sectors threatened by armored attack.

This large mobile reserve should be shifted as the mass of the hostile armored force is shifted and should retain a corresponding freedom of action. The mission of the front line divisions then becomes analogous to the mission of guns with the front line regiments except on a larger scale, that is, to slow down and impede the attack in order to give time for reserves in rear to move to meet the attacking mass.

Almost universally accepted is the idea that the best defense against the tank is a better tank. This can be questioned. That the best defense against a mechanized attack is superior mechanized force is doubtless true but this does not necessarily mean that our tanks or armored forces should be used against those of the enemy. So to use our armored force would be to dissipate its mass and fritter it away on defensive missions. Rather our armored forces should be held intact and used offensively against the enemy main forces while the hostile tanks are met with superior mechanized antitank means. This will require an antitank gun sufficiently powerful to stop the tank and superior to it in speed and maneuverability. Such a weapon must be self-propelled of a tracklaying type in order to achieve the necessary mobility. It must be lightly armored to stay in action on the battlefield. It will be a tank of sorts but one in which protection has been sacrificed for speed and maneuverability.

The Reception Center

By

First Lieutenant Charles S. Schnider, *Infantry*

As long ago as 1920, the U. S. Army officials concluded that if our national military effort was to reach a maximum of efficiency, the utilization of all of our resources, and particularly that of manpower, would have to be accomplished carefully and intelligently.

This conclusion resulted from the extreme need for "occupational specialists" which was first felt during the last World War. Occupational specialists, as indicated in A. R. 615-26, are such men, other than basic soldiers, who through experience and training, are able to perform some type of work which cannot be performed by untrained and inexperienced men. For example, telegraph operators, telephone switchboard installers, surgical and laboratory technicians, riveters, pneumatic drill operators and welders; to say nothing of stenographers, truck drivers, automobile mechanics, etc.

Today, since the advent of mechanized warfare, this demand for specialists has become a major problem and one which must be met.

No informed person denies that this nation contains a wealth of manpower already trained in civilian occupations to perform the military counterpart of that training.

The problem, therefore, was, then, as it is now, to find these men promptly, ascertain how well qualified they are, or how much additional training they might need to graduate them into the "skilled" classification, and then, without loss of time, to assign them where most needed.

The first step toward an efficient solution of that problem, a new system for the correct classification of soldiers, was borrowed from our large industries, adapted and adopted by the army.

This system is nothing more or less than the scientific accumulation of information through interviews, observation and tests concerning soldiers, and particularly their civilian occupational specialties, if any, and the classification and assignment of such men based upon an intelligent interpretation of the information so gathered.

Obviously this information and classification, in order to accomplish its purpose and benefit the army as well as the soldier, must be obtained at the outset of the soldier's military career. And to accomplish this purpose the reception center was established. (Sec. III M.R. 1-7 W.D. October 1, 1940.)

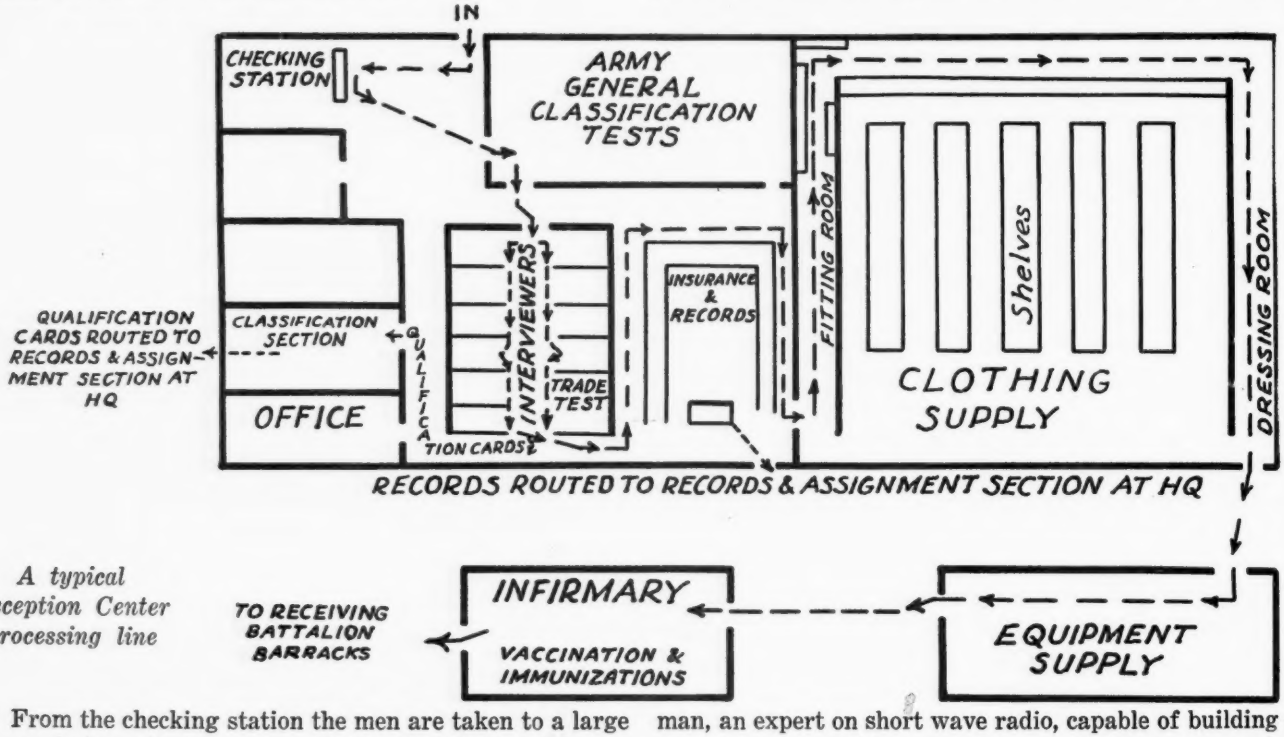
Paragraph 14, under the heading "Functions," sums up in a few words the aims and purposes of the reception center. It reads:

> "Men will be sent to reception centers from induction stations primarily for the purpose of classification, so that the best possible disposition of available skills can be made. At reception centers records including Soldier's Qualification Cards will be completed, clothing will be issued and vaccinations and other authorized immunization procedures will be given in order that organizations may be relieved of the administrative burdens connected with transforming civilians into enlisted men."

In actual practice, the reception center functions in a slightly modified version of the suggested plan of operation set out in M. R. 1-7 just mentioned.

The local draft boards, having selected the men for military service send them under the command of one of their number as leader, to an induction station. These stations, often confused with reception centers, have nothing in common with them and exist only for the purpose of giving the men a thorough physical examination, including an X-ray of the chest and lungs, finger-printing, originating their service records and swearing the men into the service. Plans are now complete and are expected shortly to be put into execution to handle a part of the induction station process by means of traveling teams which will visit large centers of population giving the prospective soldiers the opportunity of taking their physical examinations often three weeks before actual call. From the induction station, still under the command of one of their number, the men successfully completing their physical examinations are transported to one of the twenty-nine reception centers now operating. In some cases induction stations and reception centers are located together. This, however, is only a physical connection and not a functional one.

Upon arrival at the reception center the men are first taken to a checking station, where they and their records are checked in, issued a temporary identification tag and assigned to a receiving company of a receiving battalion for rations and quarters. Day or night any reception center is ready to and does receive and accommodate all arrivals from as many as four or five induction stations.



A typical Reception Center processing line

From the checking station the men are taken to a large room and given the Army General Classification Test, a new version of the old Army Alpha Test. This written examination, consisting of 150 questions to be answered in 40 minutes, is designed to fairly portray the individual's native mental ability and ingenuity as well as academic learning. Every precaution is taken to insure every man a fair opportunity to do his best. Tired men are held over until they have had an opportunity to rest before they are required to take the examination. They are permitted to smoke while the test is in progress. In the event the soldier is unable to read or write the English language, a non-English examination is provided. The examination papers are then carefully graded and the result assists the classification officers materially in a correct appraisal of the ability of the individual. Information regarding the Soldiers' and Sailors' Relief Act and an explanation of government life insurance and allotments is also given at this time.

While the men are taking the test a battery of typists in another department is making up Soldiers' Qualification Cards, adding to their service records and preparing other records, which are assembled, placed in envelopes and delivered to the Interview Section where they are returned to the men for use later on in the processing.

The Interview Section consists of a number of men trained for that purpose. Each of these men invites a new arrival into a booth, partitioned from the other booths, and in a friendly and orderly manner, by dint of judicious questions ascertains and records upon an especially designed card (Soldiers' Qualification Card W.D.A.G.O. Form No. 20), his civilian occupations, earning capacities, education, hobbies, athletic ability, ability to speak, read and write foreign languages, intelligence, previous military training, previous positions of leadership held, aptitudes and military assignment desired.

The recording of "hobbies" may seem a useless and added labor, but strangely enough this information has proven valuable in many instances. For example, one young man, an expert on short wave radio, capable of building and repairing transmitters as well as receiving sets, was found through this medium when his vocational experience was correctly listed as "farm hand." This boy was given the trade test for radio electrician which he passed with ease. As the result thereof, instead of being classified as a basic soldier, the young man was listed as "radio electrician" and sent upon requisition to fill a vacancy and demand for a skilled radio man, thus saving the army the time and money necessary to train an unlearned man in radio.

During the interview, if the inductee claims to be skilled in one line or another, and if the interviewer deems it necessary he indicates on the card that a "trade test" should be given. These tests consist of about fifteen questions, in the language of that trade or business, concerning the important principles thereof. The questions have been standardized throughout the country and are designed, in a very few minutes, to test the knowledge or lack thereof of the questionee concerning that occupation.

Having been interviewed the men proceed to the Insurance and Allotment Section where they are given an opportunity to purchase or refuse government life insurance.

While here their classification cards are routed to the Classification Section where officers, basing their decisions upon a careful analysis of the information garnered by the interviewers from the men themselves, and from the IQ as indicated by the Army General Classification Test, and transmitted to them through the medium of the soldier's qualification card, assigns the inductee to that type of military duty or occupation for which by reason of his civilian

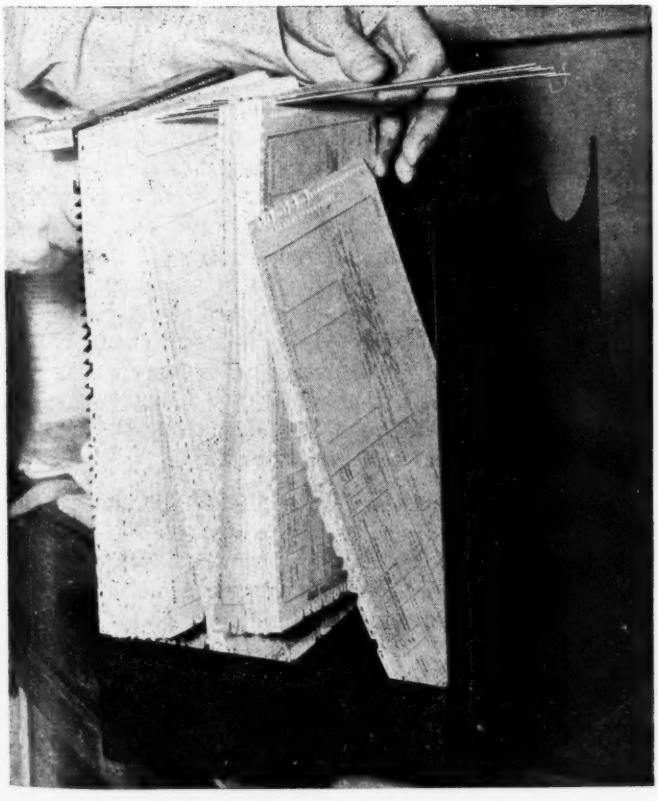
occupation, experience, knowledge or inclination, he is most nearly qualified to perform.

Primarily, of course, the interests of the army are considered. If, however, the inductee can be given the assignment he desires, as indicated on his card, at the same time remaining consistent with the best interests of the service, every effort is made to do so.

The cards are then encoded for facility in sorting later, sent to the Record and Assignment Section and there filed. The system of encoding these cards and the sorting thereof is another modern business method borrowed from our large industries and adapted to army use.

The cards (W.D.A.G.O. Form No. 20) are approximately 8" x 10½" in size and have a series of small perforations around the entire margin thereof. Each of the 287 occupational specialists as well as the basic soldier is assigned a specification serial number in A.R. 615-25 heretofore mentioned. For example "sheet metal workers" are numbered "201." The classification officer, having made his decision as to the proper classification of the soldier, jots down the specification serial number of that classification upon the card.

An encoding clerk then with the aid of a hand punch enlarges the perforations representing the serial number desired so that the cards can be used in a sorting machine (see accompanying photograph), then the cards are sent to the Record and Assignment Section usually located at the reception center headquarters building, to be filed. In addition thereto, this section daily compiles data as to the number and type of each of the 287 army specialists classifications needed by Corps Area, and the number on hand at the reception center. This information is transmitted to Corps Area Headquarters which in turn transmits the data for the entire Corps Area to the War Department at Washington, D.C. In this manner any given number or type of occupational specialists can be found upon very short notice and by requisition sent where most needed, direct from the reception center, without the waste of time and money formerly expended.



Sorting Machine in Operation

The sorting of these cards, which is done to fill requisitions, is accomplished by means of a sorting device. The cards are filed alphabetically by name. Later they go with the service records of the men to their future stations.

When a requisition is received by a reception center for a number of men of different skills, the cards are sorted and those of the men in camp meeting the qualifications desired are promptly found.

The sorting itself is done so quickly as to be almost startling. A device which looks like an ordinary ruler with a handle attached to the center thereof and having along the edge a series of small holes about the size of the perforations on the soldier's qualification card is put to use. Into these holes are fitted plungers appearing like ladies' hat pins of years ago. If "automobile mechanics" are desired the plungers are arranged so that they will fit into the enlarged perforations on the margins of the cards corresponding to "014," the specification serial number for automobile mechanics. A false bottom of the sorting tray is dropped and out come the cards of all automobile mechanics in camp.

Let us go back now to the selective service men we left in the insurance and allotment section. In the meantime the men have reached the clothing warehouse, removed their civilian garb which is later sent home, and donned the uniforms issued. Pack, messkit, metal identification tags and other equipment are also issued, after which the men before going to their barracks, pass through the infirmary where the Medical Section vaccinates them and gives them their first immunization shot. This completes what is known as the "processing."

This is not all, however, that is accomplished at the reception center. During the three to five days spent there instruction is begun in sex hygiene, personal health and sanitation, Articles of War, school of the soldier, simple squad, platoon and company close order drill, military courtesy and other basic military information.

The men sleep in modern wooden 63-man barracks, heated by gas units thermostatically controlled. These barracks are equipped with sanitary toilet facilities including showers. The mess halls are each capable of serving 100 men every 6 minutes, cafeteria style. The men eat out of stainless steel trays, steam cleaned and permitted to dry untouched. The kitchens, modern in every respect and spotlessly clean, include an array of electrical equipment such as potato peelers, meat and bread slicers, mixers, donut machines, toasters, coffee urns, steam tables, deep fat fryers for French fried potatoes, large refrigerator units for meats and vegetables and many other innovations.

A large recreation building is provided where the men are encouraged to read, write home, attend entertainments and free motion picture shows. A post exchange sells the usual items, and offers barber and tailor services.

The religious life of the men is not overlooked, adherents to every denomination being extended the privilege and opportunity of worshiping as they see fit. Morale is stressed and every effort is made to make the transition period when

the civilian selectee changes to a soldier as painless and profitable as possible.

The primary purpose of the reception center, that of promptly finding the various skilled men and assigning them where most needed, is being accomplished every day. The organizations to which the inductees in reception centers will be assigned, receive skilled men or at least semi-skilled men to fill their needs, and in addition thereto are relieved of a great many administrative details which they themselves would otherwise have to do. The men are happier and make better soldiers because many of them are assigned to work at which they are experienced and which they enjoy.

Reception centers process not only selective service men, but regular army, regular army reserve and re-enlistments as well.

Classification does not cease at the reception center. After reaching the replacement training centers for their thirteen weeks of training and before being assigned and sent to their permanent units, in order to be certain of correct classification the men may be reclassified and their Qualification Cards corrected. This is done only after the officers and noncommissioned officers at the training centers have had an opportunity to observe and study the men, which of course would give them a much better opportunity to make a final classification than the reception centers where the entire processing only takes approximately four hours and is done without opportunity to observe the individual while in the performance of normal military duties. After the individual has been assigned to a permanent organization he may be again reclassified at any time that reclassification is indicated.

It must be understood that classification is a continuing process which is completed only at the separation of the individual from military service.

S O P Intelligence

By
Lieutenant Colonel Ray L. Burnell, *Field Artillery*

"It is no good." "It works fine." "I get all the information I need." These are the extremes of unofficial reports made by some staff officers of large units recently engaged in field maneuvers concerning the operation of Intelligence Standing Operating Procedure (SOP). Official reports of higher commanders show that combat intelligence is not functioning satisfactorily, at least in some units. I believe a misunderstanding of the practical application of SOP has been a contributing factor in some instances. The purpose of this article is to clear up any confusion that has arisen.

What is the purpose of Standing Operating Procedure? According to Field Service Regulations (FM 100-5, par. 159) SOP "covers those features of operations which lend themselves to a definite or standardized procedure without loss of effectiveness." Their adoption "saves time in issuance of orders," "reduces chances for errors" and "simplifies and expedites the execution of operations in the field."

What kind of operations should be covered? Obviously, if SOP is to save time and simplify operations in the field the procedure must be simple, direct and clear. To attempt to cover all types of general and special situations would defeat its purpose. It is equally obvious that SOP should cover that type of operations which the War Department has directed be stressed in our training—war of movement, fast moving situations as we know them today.

The primary mission of combat intelligence is (FM 30-5, Par. 5) "to reduce as far as possible the uncertainties regarding the enemy and local conditions and thus assist the commander in making a decision and the troops in executing their assigned missions." Can we expect SOP in fast moving situations to obtain the essential information needed in time to be of value? It might, but we cannot expect it to. We will almost never be able to obtain all the information we would like to have. Time and enemy counterintelligence measures will prevent this. So we must be content in obtaining that which is *essential* to the commander at a particular time whether it be to "make a sound decision," "conduct a maneuver" or "avoid being surprised" (FM 100-5, Par. 20). The information essential in a particular situation depends upon the mission and plan of the commander, the terrain, the enemy strength, dispositions and his capabilities of interfering with the commander's mission. SOP cannot possibly cover the varying influences of all these considerations in a particular situation. The commander or G-2 must determine the essential elements of information in each case and then G-2 must direct and coordinate the work of all available agencies in getting this information in time to be of value. Always G-2 is working against the clock.

How does SOP function? It functions this way. SOP covers the various kinds of information that are desired, the kind of information different units should look for, the kind of information that is always of extreme importance and the action that should be taken. It requires all agencies to search for all possible information and report it promptly *but* it subordinates this work to that of searching for that information which has been designated as essential in a particular situation and upon which the attention of all agencies has been focused. The gathering of information prescribed by SOP must not be allowed to interfere with or delay the obtaining and reporting of that which has been designated as essential at a particular time.

A G-2 who sits back and waits for SOP to obtain essential information is doomed to failure just as is the G-2 who directs his agencies to obtain all information. He who takes either one of these lines of action either does not know what he is after or he is deliberately laying down on his job.

A practical Standing Operating Procedure backed up by thoroughly trained troops will, when applied in a common sense manner with an intelligent concentration of effort on essential information, contribute materially to success on the battlefield.

COMBAT INTELLIGENCE

A graphic representation showing how a Division G-2 coordinates his work with the immediate job of his commander in a meeting engagement and the period for which G-2 must project the capabilities of the enemy.

CHART I

SITUATION AT 7:00 AM

MISSION: BLUE

To seize and hold the high ground at A.

SITUATION AT 7:00 AM

At 7:00 AM the situation is as shown in Chart I. The Division Commander was confronted with the problem of deciding whether to make a piecemeal or coordinated attack.

DECISION OF DIVISION COMMANDER AT 7:00 AM

After a brief estimate of the situation he decided to develop at once in the area B for a coordinated attack to be launched at 12:00 noon. Attack orders to be issued at 9:00 AM.

INSTRUCTIONS TO G-2

"At 8:45 AM let me have latest information of enemy and your estimate of enemy capabilities to include time of attack, 12:00 Noon."

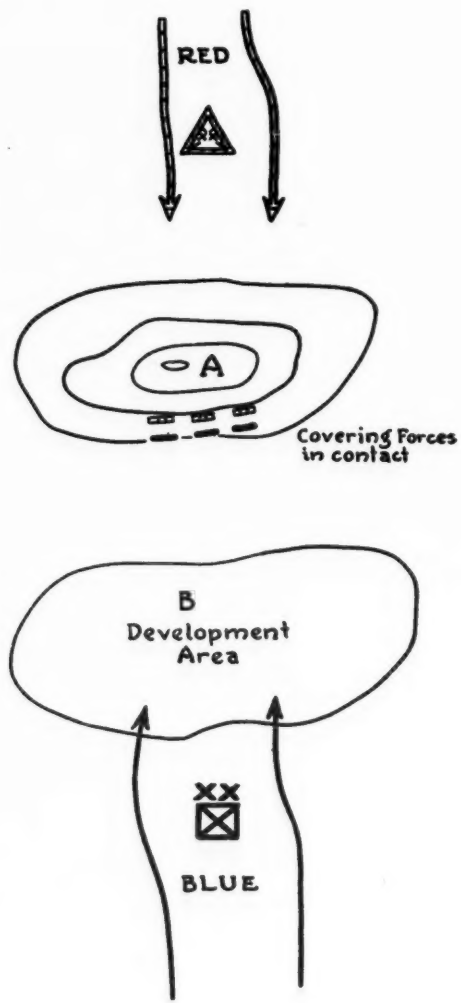


CHART II

COORDINATION OF G-2 ACTIVITIES WITH THE PLAN OF THE DIVISION COMMANDER AND PERIOD FOR WHICH G-2 MUST PROJECT THE CAPABILITIES OF THE ENEMY

Time	*Division*	*G-2*	*Remarks*
7:00....	CG issues orders for development and plans to issue orders at 9:00 AM for attack at 12:00 noon; directs G-2 to have essential information and estimate ready by 8:45 AM.	Decides on essential information and instructs intelligence agencies to report this information by 8:30 AM.	CG could have been more definite in announcing essential information needed from G-2.
8:00....	Division develops.	Information received, evaluated and interpreted.	This is a continuous process. Important information of intelligence value is disseminated whenever necessary.
9:00....	CG receives latest information, hears estimates, decides on plan of attack and issues oral orders for attack.	At 8:45 G-2 gives oral estimate of enemy situation and capabilities to include 12:00 noon. Hears CG orders, disseminates enemy information and issues instructions for additional information needed.	G-2 makes his estimate on information obtained at 8:00 AM and reported about 8:30. He must project the enemy capabilities forward to noon making a total period of some four hours. Agencies now concentrate on obtaining information that is necessary for successful execution of the attack.
10:00....	Reconnaissance, issuance of orders and ammunition by subordinate units.		He must get the latest information to the troops before they jump off. Orders and reports are fragmentary.
11:00....	Movement to attack positions and receipt of latest information of enemy.	Receives, evaluates and interprets information, disseminates intelligence to all units concerned. Issues instructions to intelligence agencies for information essential during the attack for the commander to best employ the forces under his direct control to bring the attack to a successful termination.	G-2 is now working on the enemy capabilities for the period 12:00 noon 'til dark.
12:00....	Division attack.		

The Period of Uncertainty.*

**The Period of Uncertainty.*—From 8:00 till 12:00 is the period of uncertainty. At 9:00 AM the CG issues orders for the attack based on enemy information obtained about 8:00 AM. The CG wants to know what the enemy situation will be when our attack hits him. G-2 can not tell him this at 8:45 AM but he can project the enemy capabilities forward and tell him the various lines of actions the enemy is capable of taking and what can be expected. As preparations for the attack continue, enemy commitments eventually eliminate all lines of action except the one he has adopted. G-2 must keep his commander and all units concerned informed of these changes as rapidly as they occur.

THE LINK BETWEEN ARMY AND AIR COOPERATION IN ACTION: MOBILE H.Q. OF A BRITISH ARMY-AIR INTELLIGENCE LIAISON OFFICER

An important feature in Army exercises is, of course, cooperation between the air and the ground forces. In the recent exercises, held under the auspices of Lieut.-General T. R. Eastwood, Commander-in-Chief in the North, the defenders, though weaker in men and armored vehicles, held an advantage in air power. The artist's drawing, made from sketches on the spot, represents a busy scene at the caravan mobile headquarters of an Air Intelligence Liaison Officer, thus providing the link between the Army and cooperating aeroplanes, known as A.I.L.O. At this landing-field, utilized by an Army Cooperation Squadron or squadrons, are seen Westland "Lysanders" on reconnaissance duty. The A.I.L.O., an Army officer, has his headquarters in a mobile type of caravan called a "trailer" (left) fitted with wireless, where are received all the reports from the pilots respecting the movements of the troops, direction of artillery fire, etc. The A.I.L.O., seen standing inside the trailer, on the wireless telephone, is receiving instructions from the ground forces as to what information they require from the air arm and reports back to them all information obtained from pilots in the air and their logs on landing. Outside the trailer stands the operational board giving duty details of the squadron's movements. Nearby a pilot about to take off is receiving instructions from an Air Force Intelligence Officer, while another is approaching to report. On the right an Army despatch rider has arrived with information, and others await orders for their particular units. Beyond these is another trailer allotted to resting pilots, ready to take the air, while other "Lysanders" are taking off. It will be recalled that in the debate on Crete, the Prime Minister said that he regarded Army and Air cooperation as of "the utmost consequence," and it would be increased.

—*The Illustrated London News*, 21 June, 1941.

Progressive Training of Officers

["Weiterbildung der Offiziere." Translated from the German from *Militär-Wochenblatt*, 25 April, 2 and 9 May, 1941.]

Translated and Condensed by COLONEL SAMUEL J. HEIDNER, *Infantry*

One of the most urgent duties of commanding officers even during the war, is the continued instruction of the officer corps, and the development of a source of sound and efficient officer replacements. Obviously this duty falls most heavily upon regimental commanders and the commanders of independent battalions and detachments. A proficiency test of the officers of any regiment will reveal that few officers have had the benefit of a thorough, peacetime training. The Army's extremely rapid expansion program since 1933, and the war activities since September 1, 1939, have compelled the use of short-cuts in training the officer corps. That these short-cuts were nevertheless effective, is proven by the results attained by the German troops on the battle fields in the east and west. However, we must not let this deceive us into thinking that many gaps do not exist in the theoretical and practical training of our officers, especially in the training of the young officers called to duty as a result of the war.

What is still ahead of us, no one knows, but we do know that the sword must be kept bright. For this, the surest foundation is an officer corps with a thorough and versatile training, and a sufficient supply of good officer replacements. Should peace come soon, or should the war last for a long time, this need remains, and its fulfillment is a duty which the present commanding officers owe the army and the nation.

In discussing the training of officers, we must first set up standards that are to be attained. The strength of the German Army has always been in the ability of its platoon leaders at the front. Thus it must continue to be. However, the training of a lieutenant cannot stop with proficiency in the leading of his platoon. The lieutenant may at any time, perhaps at a critical moment, fall heir to a company, troop or battery, or be called upon suddenly to act as an aide or an adjutant. In peacetime he might learn the duties of the new position by exercising them, but in time of war the case is different. War demands that the position be filled competently at any moment if mistakes, with effects that God and time cannot erase, are to be avoided. It follows that the training of the young officer must make him competent to perform any of the duties that may fall to his lot. This requires that all officers be thoroughly grounded in the tactics and battle leadership of units to include the reinforced battalion.

The word tactics causes many a young officer to shudder. This should not be so, for, to learn the fundamentals of tactics, he needs only some common sense, the regulations "Truppenführung", (Field Service Regulations) and a few quiet moments to think. Perhaps he may also need the advice of an older comrade. These facilities should be available anywhere.

We have much difficulty arising from the fact that many young officers do not know the fundamentals of tactics. From this, many, and often dangerous, errors result. Superiors are forced to cover many details in orders which the properly trained subordinate would handle on his own initiative. In this field there is much work to be done on all sides; the junior officers must study, and the seniors teach. Which task is the most difficult is of no consequence; the work must be done.

In peacetime, tactics was effectively taught by the applicatory method, that is by the use of practical examples. This method must also be used now. The map exercise is a useful method of instruction, but it has two objections; the preparation and conduct of a map exercise requires skill that is not always found, and, in spite of all lecturing, only those who actually recite get much out of the exercise. For this reason written map problems are more effective. In such a problem each officer must make a decision on the tactical issue and must solve the requirements. This compels the young officer to study the Field Service Regulation relating to the particular subject. Obviously the young officer will have to give up many evenings to this work, but the instructor who corrects the problems must give even more time. The time must be found somehow. That an oral discussion of the problems will be most useful needs scarcely to be mentioned.

While the method of applied tactics has its unquestioned value, the necessity for speed in our present training also justifies and makes necessary the use of a formal textbook method of instruction in tactics. The coach and pupil system may be effectively used in this method. The instructor should bring out the essential details in a point-by-point discussion.

The practice of calling upon officers for short, oral reports should be followed. This serves the double purpose of making the officer learn the subject matter on which he reports, and, at the same time, giving him practice in public speaking. How difficult it is for many, even among the older officers, to give their opinion in clear, understandable, grammatical language! An officer must be able to talk to be a successful instructor or leader.

One of the first subjects that should be taken up in classroom instruction is the meaning of technical military terms. It is amazing to see how much these terms are misused every day. Disciplined speech is essential on the part of officers. Very consequential errors have resulted from inexact and ambiguous language being used in orders. All the outstanding soldiers of the last two centuries, to mention only Frederick the Great, Gneisenau, Clausewitz, Graf Moltke, Graf Schlieffen, and Seeckt have preached meticulousness.

In addition to the study of the different forms of combat such as the meeting engagement, the deliberate attack, defense, retirement, withdrawal from action, etc., such general subjects as reconnaissance, military intelligence, security, observation, messages and orders, liaison, transmission of orders, antitank defense, antiaircraft defense, gas defense, and many others should be studied.

There is material in these fields for weeks, months, and years of study. Even those officers who have had the benefit of complete military-school training will find much that is new to learn. They must realize that to stand still is to retrogress.

So far the necessity has been stressed for officers to strive towards a comprehensive tactical training for battle leadership. A further requirement is that the young officer improve his ability as an instructor of his men. To train others successfully, the officer must himself first master the subject he wishes to teach, then he must learn sound methods of instruction by which he can transmit his knowledge to others. The one is as important as the other. Too many of our young officers, through lack of service experience, have great need to develop this ability to instruct.

The ultimate goal of all training must be efficiency in battle. All instruction must either directly or indirectly serve to develop efficiency and steadfastness in combat. Our excellent training regulations prescribe in detail how training should be conducted, but it is discouraging to observe how seldom they are carried out. The reason is obvious; officers are not familiar with them. They know that such regulations exist, perhaps they have handled one, perhaps even glanced through one, but that is not enough. To make these regulations the basis of our training, they must be carefully and thoroughly studied. Whether or not the young officer likes to study the regulations, he must do so if he wishes to get results in training. Not only the young officer, but the older ones too, must know the regulations in detail. To get results in the conduct of training the instructor must know what is correct according to the regulations, he must be able to detect mistakes made by his men, and finally, having discovered an error, he must know what steps to take to correct it. It is the duty of the instructor to help his men over difficulties in their training. In former times, our old noncommissioned officers were masters in the art of practical instruction.

Perhaps even more important than the mental and manual training of the soldier is his moral training, the building of his character. As a first principle it must be stated that only he who has character himself is able to develop it in others. The duty of being a moral leader is one of the highest obligations assumed by an officer. We cannot impress upon the young officer too much that he has taken upon himself this great obligation which must influence his entire life, his every thought and action. Whether in uniform or in civilian clothes, he must always regulate his conduct by the knowledge that he is an officer. Practically the officer's greatest influence in character building is had through his routine administrative duties. Housing, clothing and feeding the soldier, paying him, granting furloughs, in short, caring for him from the time he arises until he goes to bed, all falls within the field of administration. Through the manner of exercising his administrative duties, the officer can make or destroy discipline. Especially in the exercise of their administrative duties should commanders lead and develop the character-building influence of their officers.

For character building in our soldiers we do not need book-learned psychologists, but officers who understand men, officers who know the souls of men, who know the secrets of influencing, judging, and handling men. In discussing this subject one often hears the opinion expressed that the art of leading men is inherent, that lacking it, nothing can be done to develop it. This idea is false. However, leadership cannot be taught theoretically, but the young officer who may any day step up to command a company can be developed as a leader by assigning him every type of administrative duty, and by carefully supervising and guiding him in the performance thereof.

Classroom instruction can be used effectively in the training of soldiers. There the soldierly virtues can be taught, his spirit developed, and technical knowledge imparted. Much difficulty in classroom instruction comes from the fact that the officer does not come down to the mental level of the average soldier. Many officers ramble on in the abstract when they should resort to concrete examples which the soldier can understand. These examples should be taken from the life and thought orbit of the soldier. Too often, too, there is a lack of preparation by the officers. There is a mistaken notion prevalent that after one has gained the right to wear shoulder straps he no longer needs preparation. Preparation should not be limited to a knowledge of the subject to be taught, but should extend to a study of the best methods of presenting it. Sometimes one hears an instructor ask a question which, for ambiguity and indefiniteness, could scarcely be surpassed. Mental order is an essential prerequisite for successful teaching. From the soldiers, strict deportment should be exacted. A clear question should be answered by a complete sentence. The habit, so often observed, of answering a question by a single word, must not be permitted.

The young officer who becomes a commander must know how to arrange the daily schedule so that his unit can get the maximum training. The standard of training of the German Army is surely high, but it could be higher still if no time were wasted.

Experience has shown that one of the most difficult tasks for young officers is the preparation, conduct and discussion of small tactical problems. A few pointers may help. The first essential for such an exercise is a well-defined, simple subject. If too much is attempted in one exercise, the result will be poor. It is better to learn a few things thoroughly than many superficially. The selection of terrain for a problem is important. Unfortunately there may not be much choice. If there is a choice, terrain most favorable for the particular maneuver to be taught should be used at first. Later the same maneuver may be tried on more difficult terrain. Frequent change of terrain should be made where possible. The tactical situation should be simple. It is not necessary to waste time in justifying the situation; wars have placed units in every possible situation. Simplicity and clarity are the essentials. All artificiality should be omitted. Mistakes will be made. To detect them, umpires are necessary. The umpire must be versatile, know the purpose of the problem and how it is expected to develop, and must enter wholeheartedly into the spirit of the problem. Mistakes must be carefully reported; only in this manner can anything be learned from the exercise. A critique should be held. Pointing out errors to subordinates, however, is not sufficient. It is necessary that they be made to do the thing correctly. This can be accomplished by repeating the exercise. Small changes such as interchanging units, may be made when the exercise is repeated. It is important that enthusiasm be aroused; it is well known that he who learns cheerfully, learns well. There is no reason why any lieutenant should not become able to put on an instructive tactical problem.

The physical care of the men is as important as their instruction. The young officer must be taught all the details

of company administration by actually performing them. If he has not learned them, he will become dependent upon his first sergeant and mess and supply sergeants when he suddenly inherits a company. It is true that most of these non-commissioned officers perform their duties well, but they nevertheless need intelligent supervision. As an example of how a lieutenant may be taught administrative duties, let us assume that a soldier has committed a serious offense. The lieutenant should be given the task of investigating the offense and of making recommendations for the punishment to be awarded. Similarly other administrative duties may be taught.

Much more could be said on the subjects touched above. Our purpose, however, was not to give details, but rather to indicate the broad lines along which the further training of our young officers may be accomplished.

The Russo-German War

BY
COLONEL F. M. BARROWS, *Field Artillery*

For anyone at this time to try to write anything more than a mere sketch of the Russo-German War would be mere folly. A large part of what one would write might be later disproven. This short narrative merely attempts to state events in general, leaving out all strategy and tactics, and, to make it as simple as possible, it endeavors to give the reader a fair idea of the big picture of the war to date.

A week before World War II which began September 1, 1939, Germany and Russia made a treaty of non-aggression in which each party bound itself for ten years to refrain from using force against the other; to give no support to any warlike acts of a third power against the other party; and to settle any conflict of interest by direct discussion or arbitration.

Less important was a commercial agreement signed several days before.

A third agreement dated 28 September, 1939, followed the actual partition of Poland. It ratified the divisions of territory and permitted Russia, among other gains, to hold the Galician petroleum deposits.

In this connection it must be remembered that Japan, Germany and Italy were linked by the Anti-Comintern Pact of 1936 (aimed at Russia). Also in September, 1940, Germany, Italy and Japan signed their Tripartite Pact, the author of which, Matsuoka, the foreign minister of Japan, said to the Japanese Diet: "In the event of an attack on any of the parties to the triplice there arises the obligation for Japan to participate in the war."

What made matters more complicated, Russia and Japan signed a Neutrality Pact in April of this year by which the two nations agreed to "maintain peaceful and friendly relations between them" and that if either were attacked, the other would remain neutral.

On November 30, 1939 the Russo-Finnish war began with Russia the aggressor, resulting in an interchange of territory in favor of the Soviet Union. In the light of subsequent events, it appears that Russia needed that territory for her protection of Leningrad in the present war, and since she did not absorb Finland, many now believe that was her sole reason. All she took was a buffer strip that has since stood her in good stead.

At the time of the German-Polish War, Russia secured about half of conquered Poland. That, with her acquisition (about the same time) of Estonia, Latvia, and Lithuania, which Hitler didn't like but had to stomach, and a little later, the grabbing of Bessarabia, gave the Soviet Union an excellent buffer strip against the Axis, extending some 1500 miles —from east of Lake Ladoga to the Black Sea. This buffer strip was a most wise acquisition, as one can see by glancing at the map, and, except for the Ukraine, little fighting has so far been on Russian soil. So one might say the Russian bear was not exactly asleep and this acquired sponge has not only absorbed thousands of German lives and material but has given the Soviet Union time to mobilize the rest of her army and better prepare her defenses. Reports state she has some 300 divisions now mobilized.

There are many reasons given for Hitler's launching his attack on Russia, but it is too early yet to state definitely why he did it. Commentators have given them all, over the radio and in the press, but only Der Fuehrer and a few of his henchmen really know and they probably have not told us the real reasons yet.

However, it might be well to remember that in his "Mein Kampf" his thesis was that the Reich's destiny lay in eastward European expansion. Also in September, 1936, he launched a propaganda attack on the Soviet Union, calling for a world crusade against Bolshevism in the following words: "If the Urals with their immeasurable treasure of raw materials; Siberia, with its rich forests, and the Ukraine, with its limitless grain fields, were to lie in Germany, this country under National Socialist leadership would swim in plenty." However, a few would contradict the statement that Hitler would never have begun this war had he believed he could have invaded England this fall.

There is little known of the Stalin Line, in fact several writers doubt its existence. However, it is shown on the accompanying maps in the position most reputable publications have placed it. It is said to be not a line but a zone of considerable depth, in some places as much as fifty to seventy-five miles.

The Russo-German War began on 22 June, quite oddly with a declaration of war, in which Hitler said: "I have therefore today decided to give the fate of the German people and the Reich and of Europe again into the hands of our soldiers."

As usual, in his blitzkriegs, this one started with the same strategy and tactics as in Western Europe and in the Balkans. The big show was merely reenacted in another theater. As stated in the last *Review* with reference to the Balkan debacle, "first came the airplanes attacking cities, railway communications, roads, enemy airfields, and airdromes, and the dropping of parachutists, their object being

THESE TWELVE MAPS SHOW THE WEEK-BY-WEEK PROGRESS OF THE NAZI OFFENSIVE IN THE RUSSO-GERMAN WAR. DATES OF EACH WEEK ARE SHOWN IN THE UPPER RIGHT HAND CORNER OF EACH SKETCH.

to paralyze the Russian air services and communications and to affect adversely the civilian morale." Then came the movement forward on the whole front from Finland to the Black Sea with the customary breakthrough of the armored forces.

As nearly as we can tell now there were at the start roughly about 175 German divisions and some 25 other pro-Nazi divisions massed against Russia while she had some 170 divisions grouped fairly near the border. Probably twenty of the German divisions were armored.

The Nazi advance was quite rapid at the start, and at the end of the first month (see map) it could be seen that the attack was taking shape as follows, from north to south:

Falkenhorst's army advancing on Murmansk and the Murmansk-Leningrad railroad.

The Finns under Mannerheim advancing southeastward on both sides of Lake Ladoga.

Von Leeb's armies were advancing northeastward toward Leningrad.

Von Bock's armies were advancing eastward on Moscow, the spearhead having reached Smolensk.

Von Rundstedt's armies were advancing on Kiev.

Antonescu's armies were advancing on Odessa.

These Axis groups of armies were opposed by three Russian groups as follows:

The northern or Leningrad group under Voroshilov.

The central or Moscow group under Timoshenko.

The southern or Ukraine group under Budenny.

From the beginning it has been one mammoth continuous battle, the greatest in world history, on a scale beyond our imagination in which millions are pitted against one another, thousands upon thousands killed, wounded, or captured, cities destroyed by fire, shell and bomb, forests and fields laid waste and Russia, so the report goes, leaving naught but "scorched earth" and desolation for the Nazi forces.

In looking at the accompanying maps of the week by week progress, one can see there was a rapid advance during the first four weeks, of from 200 to 400 miles and this against serious opposition. The Axis forces then for the next three weeks made practically no progress except at the points of the spearheads; this undoubtedly because of the long lines of communication, necessity for reorganization and the movement of bases nearer to the front, and needed rest for the troops. Of course, the opposition had a great deal to do with it.

It must be remembered that this let-up by the Axis was beneficial to the Soviet as it enabled them better to organize their forces, complete their mobilization, and place their reserves in more advantageous positions strategically and tactically.

The eighth week we see the Axis forces again advancing especially in the north and south, the Finns and Hitler's northern group of armies closing in on Leningrad, the southern groups entering the Ukraine.

As we go to press, the Finns and the Germans are very close to Leningrad, which, like Odessa, is becoming a besieged city. Ever since the start of the war, Stalin has been preparing Leningrad for this siege and if she holds out, as Odessa is doing, it will be a bitter pill for Hitler.

In the center, little further progress is being made by the Nazis forces toward Moscow.

In the south, that part of the Ukraine west of the Dneiper River is in the Axis hands, except for Kiev, which still is able to hold out.

In Russia, as in England, there are no open cities. If Hitler wishes them, he must take them by fire and sword and when he finally has taken them, he, like Napoleon, finds ruins and desolation.

And so in this, the 12th week of the war, we find the Soviet Army, "though beaten back and severely punished," still intact. It has taken a heavy toll of Hitler's war machine and, what is also most important, has caused the German people and all those under Hitler's domination to cast doubts on its reputation for invincibility.

We know little of the strategy and tactics of this war, but we do know that Stalin has landed powerful counter-attacks and is still doing so. It is also reported that he has allowed the Nazi mechanized spearheads to advance without resistance in order to pinch them off and destroy them in detail by cutting off the motorized and foot troops that were supposed to follow.

Apparently, it can be said that Hitler's time table has been unquestionably upset, that his estimate of Russian strength was at fault, that the necessity for a two front war was not to his liking, and that the results thus far attained against Russia have been a great blow to his prestige. The fight Russia has put up has boosted British morale and apparently dampened Japan's Axis ardor.

Probably in this the 12th week of the war there are around nine or ten million men engaged in this gigantic struggle, four million pro Axis, the balance Russian. Of course these figures are only approximations gathered from various sources, but they do give some idea of the magnitude of this war.

No one knows anything about the losses on either side except that they are enormous. If we believed the reports as to losses there would be few soldiers left to fight, but still the war goes on with little abatement. The Soviet Air Service is not crushed and is even bombing Berlin. The Russians are counterattacking vigorously, especially on the central front, and Russian morale seems as high as ever. England's bombing of German cities and those of the occupied countries keeps some German planes out of action on the eastern front and British planes are reinforcing those of Russia on the eastern front. The taking over by Stalin and the British of Iran helps the Allied side and opens up a new route for supplies and perhaps troops to enter the Soviet Union.

It has undoubtedly occurred to Stalin and also to Hitler that in about a month "the season of protracted cold and snow" will descend upon the Soviet Union. Even Kiev far to the south is colder in January than is Hammerfest, in Norway, above the Arctic Circle.

Der Fuehrer may well recall Napoleon's entry into Russia where "the infantry of the snow and the blast smote his legions and death rode the icy winds of winter," also that the German is occidental and his philosophy has instilled in him the feeling that he's got to live, while the Russian, more oriental than occidental, knows he's got to die. Perhaps Russia will be Germany's burying ground as China is that of Japan.

Iranian Campaign

The Iranian Campaign was short and sweet, lasting but four days.

The Russian and British governments claimed German agents and fifth columnists in Iran were a menace to their security from a strategic standpoint. Iran is the fourth largest oil produced in the world. A railroad which joins Adaban on the Persian Gulf, with Russia, passes through the Iranian oil fields. This railroad also shortens the supply line into Russia.

The campaign was speedy and bloodless, the Russian forces advancing from the north from both sides of the Caspian Sea on Tabriz, Ardebil and Bandar Shah. The British (Indian) forces quickly captured the oil refinery at Adaban (capacity production of 200 to 300 thousand barrels a day) and the railroad terminal at Bandar Shapur, the Iranian Navy, several Axis ships, and the Iranian oil fields.

After the Cabinet of Premier Ali Mosur resigned on the third day of fighting, a new one was formed under Ali Furanghi, prominent Iranian statesman.

His Majesty, Reza Shah Pahzavi, agreed to cooperate with Russia and Britain.

Results: (1) Plocked Hitler's path eastward to India and the Far East and southwestward toward Egypt, his path toward the Persian Gulf, and his pathway to the Russian Caucasus from the south; (2) prevented Hitler from getting much-coveted Iranian oil; (3) establish a possible additional route for more aid to Russia; (4) paved the way for further joining of Russia and British Empire troops in defensive, and perhaps later offensive operations.

That is all.

The Far East

Things are quite mixed up in Japan's Far East problem. Looking over events for the past four years, we find the following:

1. Japan, Italy and Germany, in 1936, signed their Anti-Comintern Pact—aimed at Russia.

2. In August of 1939, a week before World War II commenced, Russia and Germany signed a ten-year Non-aggression Pact, by which Hitler, tongue in cheek, reversed his position toward Russia.

3. In September of 1939, Japan, Italy and Germany signed their Tripartite Pact, concerning which Matsuoka, Japan's Foreign Minister, in a considered statement to the Diet declared its effect to be: "In the event of an attack on any of the parties to the Triplice there arises the obligation for Japan to participate in the war."

4. In April of 1941, following Matsuoka's conference with Hitler, Japan and Russia signed a Non-aggression Pact by which the two nations agreed to "maintain peaceful and friendly relations between them."

5. On June 22 the Russo-German War commenced, and Hitler resumed the role of the "savior of the world against communism."

6. Japan's negotiations with the Dutch East Indies for increased amounts of oil, rubber and tin were unsuccessful.

7. The British have reinforced Malay and Singapore, and defenses in the Philippines and the Dutch East Indies have been strengthened.

8. Trade restrictions have been placed against Japan by other-than-Axis powers.

9. Japan's move into Indo-China, in July, 1941, has not set so well.

10. Japan does not view with pleasure aid to Russia via Vladivostok, especially articles denied Japan.

11. Germany's Russian Blitzkrieg has lost some of its "Blitz".

12. The Sino-Japanese War is now in its fifth year, and its end not even in sight and is a continued drain on Japan's finances, man-power and resources.

Lumping all the above, one might say that Japan is on the spot. The situation caused a shake-up in the cabinet and leaves her more or less out on a limb—with a very uncertain future—for with her Axis partners so undependable Japan must face the possibility of finding herself alone in a sea of troubled waters.

MILITARY NOTES AROUND THE WORLD

BOLIVIA

Bolivian Antimony:

A close study of Bolivia's antimony resources, with a view to making her the main U. S. supplier, is being concluded, for transmittal to Washington, by Bolivian Ministry of National Economy. Bolivia is one of the world's four chief antimony sources and in 1938 provided 32% of all exports, more than any other. China shipped out 26% and Mexico 25%. Czechoslovakia is the other chief producer of the metal. Antimony is on U. S. Army-Navy "strategic list" of which most U. S. consumption must be imported.

(The Hemisphere)

BRAZIL

Brazil Reserves Strategic Exports for U.S.:

To Brazil goes the distinction of being the first major Latin-American power to embargo all shipments of certain strategic commodities to any country save the United States. Previously, various Latin American republics had imposed a prohibition on the *re-export* of certain commodities obtained from the United States, and in other cases a rigid export licensing system had aimed at much the same purpose as that served by the recent Brazilian decree. The Brazilian measure—which embraces rubber, manganese ore, industrial diamonds, quartz crystal, and mica—goes further, however, than any similar steps taken elsewhere in Latin America.

The Brazilian decree is of interest since it points the way toward similar arrangements which will eventually, perhaps, be reached with all the Latin American countries.

(Pan American News)

COSTA RICA

Twelfth Mission:

Costa Rica recently became the twelfth Latin American country to receive a United States military mission, when Costa Rican Minister to Washington Luis Fernandes and Sumner Welles signed a four-year agreement on the subject. Countries which already have United States missions are Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Haiti, Nicaragua, Peru, and Venezuela.

(The Hemisphere)

FRANCE

Gas Generator Trucks Cross Sahara:

An automobile convoy, made up of trucks operating with gas generators, this summer completed a first crossing of the Sahara, following the Mauritania trail. Made up at Marseilles under the supervision of the Department of the Colonies and under the command of Capt. Lancrenon, of the Colonial Artillery, the convoy landed at Oran toward the end of March. It arrived at Dakar about the first of May after having successfully completed the trip and having touched en route at the cities of Meknes, Casablanca, Agadir, Tindouf, Bir-Mobhrein, Fort-Gouraud, Atar, and Saint-Louis-du-Sénégal, or a total of more than 4,000 kilometers of which 1,800 were through the desert. Renault trucks were used equipped with Renault-Pontchal gas generators operated with charcoal. In spite of the rigors of temperature, sand storms and the other difficulties, the mission was a success.

(La France Militaire)

GERMANY

New Tactics for U-Boats:

In the last war the Germans started their submarine offensive against the naval vessel; but this time they at once made the merchant ship their main objective. Now, also, the Nazi air arm can cooperate efficiently with the submarine.

The Germans some time ago put the construction of small submarines on a mass basis, with an estimated production rate of around 25 a month. This figure may lead to miscalculations as to the number of submarines actually available. In general, only about one-third of the total number of submarines available can be at sea at one time. Crews are under a great strain and craft must be overhauled after any great length of time at sea. Nevertheless, it is a safe assumption that many more German submarines are at large in this war than in the last.

Instead of operating individually, the small submarines now work in groups, probably under the leadership of a larger submarine which is able to maintain radio contact with long-range scouting planes. This arrangement enables the submarines to spot each convoy and plan their attack with great accuracy. In fact, they no longer have to use their own periscopes to detect shipping, but can remain submerged until the time for attack arrives.

(Foreign Affairs)

Dyeing Is Their Escape:

German airmen who have been forced to bale out over the Channel are now making use of an added safety device by means of which they may be detected from a great height by any German airplane in the vicinity. The device consists of dyeing green a large patch of the grey-blue water so that the stricken airmen are floating on a clearly visible background of their own making. Before the aviators parachute out of their injured machine, they drop a collapsible dinghy,

the equipment of which includes a bottle containing a special green liquid. Once aboard the dinghy, they pour this liquid into the sea, and the resulting color patch provides a contrast which greatly assists aerial detection.

(Illustrated London News)

Germany Strong in Air:

According to American observers inside the Reich, Germany has about 200,000 parachutists and air-borne infantrymen. The strength of the Luftwaffe, including antiaircraft artillery units, is said to be between 550,000 and 600,000 men. The entire German armed forces do not exceed four and a half million men, equal to 35 per cent of the potential conscripts. The majority of the first-line troops cannot be used for operational purposes, but have to garrison occupied territories.

French sources recently quoted Colonel General A. Löhr, Commander in Chief of the 4th German Air Fleet, as having said that the number of fighting machines under his command at the outbreak of the war amounted to 3,000. The French source draws the conclusion that the total first-line strength of the German Air Force amounts to at least 15,000, not counting the many new squadrons which have been formed since September, 1939.

(The Aeroplane)

Figures on Oil for Reich:

Recent estimates of Germany's 1941 oil production give the following figures—Raw oil: about one million tons, equal to 800,000 tons of finished products; synthetic and hydrogenetic production: about five and a half million tons—provided that output can be maintained without interruption. Imports from Rumania are put at about three and a half million tons a year (output for the first quarter of 1941: about one and a quarter million tons; for the first quarter of 1940: about one and a half million tons). Those from Russia were between 800,000 and one million tons per year. German stocks are estimated at three million tons. Germany's fuel requirements for industrial and military purposes amount to at least one million tons per month. The requirements of her partner and of the occupied territories have also to be met from German resources.

(The Aeroplane)

GREAT BRITAIN

"Airgraph" Air Mail:

An experimental air mail service known as "airgraph" is to be introduced shortly for correspondence to and from the Forces in the Middle East. The homeward service will be started almost immediately and the outward service from Great Britain so soon as possible.

The "airgraph" is a system in which the sender writes his message on a special form which is photographed onto a small film. The film is then sent by airplane to its destination and on arrival is enlarged and posted to the addressee. The great asset of the "airgraph" is its saving in weight. By this method 4,500 film negatives weigh only 1 lb., whereas an equivalent number of ordinary letters weigh about 1½ cwt.

The special form used for the original message measures 11 inches by 8 inches, and the address is printed in block letters in a panel at the bottom of the form. When photographed on the small film the letter is reduced almost to the size of a postage stamp and, on arriving at its destination, is enlarged to 5 inches by 4 inches. This enlargement is posted and delivered in the ordinary way, the printed address showing in a cut-out panel in the envelope.

The cost of the "airgraph" service will be 3d. per letter. This is said to be the first service of its kind to be introduced anywhere in the World.

(The Aeroplane)

Civilian Casualties Small:

The British Government, depending too heavily upon the experience of the poorly defended Spanish cities during the civil war and underestimating the ability of its own defenses to keep enemy planes at great heights, anticipated many deaths and injuries in air raids rather than general dislocation of civilian life. While civilian casualties have been relatively small, considering the scope and duration of the raids—41,488 dead and 53,498 wounded up to June 30, 1941—the families whose homes and entire possessions were instantaneously destroyed created the most serious problem.

Provision was made for immediate compensation in such cases, for households with an income under £400, and for loss of clothing for an applicant with an income of less than £250, or £400 if he has dependents.

Outstanding among the many different emergency agencies that have developed, have been the community feeding organizations, including mobile canteens, catering establishments in air raid shelters, and "British Restaurants." Steadily growing fleets of mobile kitchens are in use for heavily raided areas, while in London nearly 1900 public shelters now have feeding arrangements for 200,000 persons nightly. Increasing numbers of communal restaurants provide meals for only 6d.

(Foreign Policy Reports)

RUSSIA

Supply Shipments Difficult:

The ability of the United States to send supplies to the Soviet Union is seriously limited by the lack of available ports. The ice-free port of Murmansk and its railway to Leningrad are menaced by the German drive in the north, while Archangel, farther east, is frozen during the winter months. A second route is offered by the Trans-Iranian railway, which connects the Caspian Sea with the Persian Gulf, but its carrying capacity is probably limited. The most convenient port is Vladivostok, from which supplies could be sent to Soviet forces in the Maritime Provinces or shipped across the Trans-Siberian railway. Vladivostok can be reached, however, only by means of the narrow channels through the Japanese archipelago and the Sea of Japan. Shipping shortages create another difficult problem, because a considerable portion of the Soviet Union's merchant marine—which consisted of 246 ocean-going vessels, totaling 938,357 tons on January 1, 1941—is probably locked up in the Baltic and Black Seas.

(Foreign Policy Bulletin)

Black Gold in Russia:

Russia is the world's second largest producer of crude oil and the only major power beside the United States which normally covers its petroleum consumption from domestic

sources. Seventy-five per cent of Russia's oil is pumped from the fields around Baku, on the Caspian Sea, and 17 per cent more from the Grozny and Maikop fields on the northern slopes of the Caucasus Mountains. Some of the oil is transported across the Caucasus by three pipelines which terminate at Black Sea ports, thence by tanker and barge to the large industrial areas of Western Russia. The Caucasian oil is also carried by tank-car and river barge to the consumption centers to the north and west. Increasing in importance are the rich oil-bearing areas in the Ural-Volga region, which accounted for 6.4 per cent of the Union's production in 1939. In the Far East, Russia possesses small fields in the northern part of Sakhalin Island, where Soviet and Japanese installations together extracted about 4,000,000 barrels of oil in 1940.

(Foreign Policy Reports)

Early Statement of Policy:

Almost five years ago, on September 12, 1936, Adolf Hitler frankly declared: "If the Urals, with their immeasurable treasure of raw materials; Siberia, with its rich forests; and the Ukraine with its limitless grain fields, were to lie in Germany, this country under National Socialist leadership would swim in plenty."

(Foreign Policy Bulletin)

Air Strength on Fighting Line:

Writing in *"La Guerre Aerienne"* in January, 1940, an officer of the French Air Ministry gave the operational strength of the Red Air Fleet on the European Front as between 5,000 and 6,000 machines immediately available.

The three Red Air Fleets in Western Russia are the first line of operational units, while—according to a German official source—units of almost equal strength are kept in reserve east of Moscow.

In the fighting so far, two Russian types seem to have done well—the I-18 fighter, which resembles the Spitfire, and the TB-6 four-motor bomber. The great L-760 six-motor bomber has also been reported in action.

(The Aeroplane)

SYRIA

Artillery Hit Hard:

In the recent fighting on the outskirts of Damascus, British field artillery gave good illustration of the old principle that sheer audacity is sometimes a sure steed to bestride.

An attack on the suburb was not making progress, so the gunners decided to solve the problem in unorthodox style. A whole battery of eight 25-pounders charged in line across a piece of open ground and engaged the Vichy tanks and machine-gun posts at the edge of some houses at a range of less than 1000 yards. The village was plastered with shell fire and the French began to give way. The attack was then pressed, two guns at a time being pushed forward to 500 yards range, then two more, until the defenders could stand it no longer and fell back on the Beirut road.

(London Times)

UNITED STATES

Superior Helmet Designed:

The search for a good, all-around helmet seems satisfactorily to have ended. During the first World War the United States Army, on the hunt for a suitable helmet, tested a number of models and finally settled on the British "Shrapnel Hat" as the best that could be procured within reasonable ballistic limits.

In December, 1940, the Chief of Infantry directed that a new helmet be developed suitable to meet the needs of the modern soldier. The result is the new TS3 helmet. Greater depth and coverage was given to the helmet within the limitations imposed by vision, weapons and movement.

The new helmet covers 80 per cent more of the head than the 1917 helmet, has little difference in weight and is many degrees cooler. It resists projectiles better, stays on the head with greater stability and is more comfortable in every way. The only drawback seems to be that, like all deep helmets, it accentuates head noise somewhat, and, by covering the ears, makes the use of telephone or earphones inconvenient.

Incidentally, the process of developing the new steel helmet also solved the problem of a comfortable hat for the soldier. A fabric "liner" was devised which is worn as a hat. It is the precise shape of the helmet. The steel helmet fits neatly over the "liner," the latter providing part of the helmet suspension.

(Infantry Journal)

New Flying Suit on Order:

A new electrically heated flying suit to keep aviators warm at high altitudes has been perfected and 12,000 of them have already been ordered.

Designed to keep an aviator comfortable through a 130 degree range of temperatures, from 70 degrees above zero to 60 degrees below zero, the new flying suit is wired throughout and the amount of heat supplied electrically is controlled for adjustment to changes in temperature.

The new suits are many pounds lighter than the sheepskin-lined garments they replace—an advantage in itself in flying—and offer more facility in manipulating instruments, controls, and armaments. They are less expensive to produce.

Short-Sleeve Shirts for Philippine Troops:

Short-sleeve shirts with a roll collar, to be worn without a tie, have been authorized by the War Department for use by U.S. troops stationed in the Philippine Islands. The use of a tropical helmet also was authorized. The action was taken for the comfort and efficiency of the troops.

Two-Way Radios in Maneuvers:

The problem of simulating artillery fire, which has always been one of the most difficult in maneuvers, has now been solved by General Headquarters through the use of two-way police type radios, the War Department announces.

Recent maneuver reports show that the marking of artificial artillery fire in war games has been improved from 40 per cent to 92 per cent with this method. In this way, the Army has not only cleared up one of its biggest maneuver problems but has taken another step toward achieving the high degree of realism that has been prescribed as a primary maneuver objective by Lieutenant General Lesley J. McNair, Chief of Staff of General Headquarters.

The voice radio sets employ frequency modulation, and are used for communication between markers stationed in the front lines, who report the effect of simulated artillery

fire there, and umpires in each artillery battalion headquarters. The frequency modulation feature prevents interception by other radio units in the field, which are not of the frequency modulation type. Thus troops cannot learn in advance that they are about to be fired upon, and the vital element of surprise is preserved. One of the advantages immediately noted when the radio system was tried in the recent Tennessee maneuvers was the effective speed they made possible.

Within an average of five minutes after battalion umpires broadcast the fire data of the batteries under their control, the markers at the "front" were registering the casualties on troops and equipment and directing the consequent changes in the tactical situation.

Coast Artillery Gunners Use Red Lens Eyeglasses:

Antiaircraft gunners in Coast Artillery units are now looking at the world through "rose" colored glasses as they observe tracer shells in target practice.

Eyeglasses with red lenses have been issued to replace those with amber lenses to provide greater contrast between the tracer and the sky. Research into their use by the Coast Artillery Board at Fort Monroe, Virginia, has shown that the red lenses are better than any other color glasses, and are better even than binoculars with filters, particularly on hazy days.

To observe tracer streams in target practice, gun crews must see with good contrast up to the effective distance of 37-mm and 40-mm antiaircraft guns. Larger guns do not need tracer shells because they are burst by time fuses. The 37 and 40-mm shells also burst but only if they hit a target.

Two Tones for Camouflage:

The Alaskan Defense Force is to be equipped with new reversible ski uniforms. They will be white on one side and forest green on the other to permit the greatest use of protective backgrounds. The uniforms will follow the conventional ski-suit design and will be wind- and water-repellant. The Alaskan troops will have fur clothing for extremely cold weather and waterproof suits for the rainy season.

Blood Plasma for Transfusions:

The War Department is seeking blood donors to supply a total of 200,000 half-pint units of dried blood plasma for use by the Army and Navy. The plasma, by use of a special device, may be used for a blood transfusion on the battlefield, where it would be impossible to perform a regular transfusion. It is expected that this plasma, now used in armies generally, will save many lives.

Showers on Wheels:

Clean soldiers make good soldiers, and to this purpose the Army is experimenting with new mobile units that provide baths, physical examinations and new sets of clothing for fifty soldiers an hour under maneuver or battle conditions. The unit consists of a trailer and four tents. The soldier undresses in the first tent and his clothing is sterilized in the trailer and sent to a salvage tent. After undressing, he takes a shower with eleven others in the trailer. In the third tent he is given a physical examination and, in the fourth, a complete change of fresh clothing.

New Military Dictionaries:

So that Army officers will be both literate and articulate in any country they may find themselves, the War Department is compiling six foreign language dictionaries primarily designed for military use. Included will be words in common social use, the vernacular of soldiers, foreign technical and military idioms, and illustrations of the latest military mechanisms. Languages included are Spanish, Portuguese, German, Italian, French and Russian. Possible use of the handbooks for intelligence and combat officers is unlimited. The project was started two years ago, under the direction of the War Department.

Foreign Propaganda Analyzed:

The Federal Communications Commission reported its Foreign Broadcast Monitoring Service, operating on a 24-hour every day basis, is now daily translating, transcribing, analyzing and furnishing to appropriate Federal officials from 600,000 to 900,000 words broadcast from foreign stations and recorded at four U.S. listening posts: Portland, Oregon; Kingsville, Texas; Santurce, Puerto Rico; and Guilford, Maryland. The agency said Germany bombards the U.S. alone with nearly 11 hours of broadcasts daily; Britain 6 ½ hours; Japan 4½ hours; Italy more than 4 hours.

The four listening posts communicate with Washington by radio, telephone, teletype and telefax. Broadcasts are studied for trends of effects of propaganda and significant information is "piped" to Washington in spot bulletins, daily reports, analyses and weekly summaries.

Provisional Antitank Battalions Formed:

The War Department is forming twenty-two provisional antitank battalions. Fourteen of these will be in infantry divisions. The other eight will be provisional General Headquarters antitank battalions which are being formed by the field artillery brigades of seven army corps and an army.

The War Department has also directed that an antitank officer be assigned to every division, army corps and field army staff for the specific purpose of assisting the plans and training officer in working out methods of defeating armored force attacks. These officers may belong to any branch and will be appointed by the respective commanders from the ranks of their own organizations.

In forming the provisional battalions, commanders have been directed to employ the antitank personnel, weapons and equipment now incorporated within field artillery organizations. Infantry regiments will not contribute to the temporary battalions. They will retain their antitank companies, which are armed with 37-mm guns.

The provisional battalions will operate directly under the control of division, army corps and army commanders, depending on their assignment. The divisional battalions, however, will normally stay with their divisions.

Army Gains 30,000 Combat Men:

The Army will gain 30,000 more men for its combat organizations by giving military "housekeeping" jobs now held by soldiers to civilian employees.

The number of soldiers thus relieved from non-combat maintenance duties would go far toward the creation of a new Army Corps.

An appropriation of $43,940,000 for the Quartermaster Corps, passed by the Congress as part of the Military Establishment Appropriation Bill for 1942, makes this act possible. This money will be used to employ 30,000 civilians to fill the following classifications of positions necessary for the management and upkeep of posts, camps and other establishments of the Army: operators of telephone, teletype and radio equipment; engineers, electricians, draftsmen, carpenters, blacksmiths, plumbers, steamfitters, machinists, sheet metal, leather and canvas workers; butchers, watchmen, janitors, firemen and clerks.

The civilians who will take the places of enlisted men in station complements will be under supervision of Army officers. Similar positions, where they exist within tactical organizations, will continue to be occupied by military personnel.

The plan will contribute to the fighting efficiency of the Army not only by making 30,000 more troops available for combat functions but also because a large part of these troops are specialists who will be valuable as instructors in the expanding Army.

Mobile Service Stations Keep Army Trucks Moving:

Civilian motorists have come to depend on roadside service stations for gasoline, oil and water and for minor repairs and adjustments. But in the Army the "service stations" are carried right along with the convoys.

Among the latest developments in mobile units tested at the Holabird Quartermaster Depot, Baltimore, Maryland, are a complete lubricating truck, a tire repair shop and a water trailer.

The service station on wheels can service two vehicles at once. It has a gasoline engine-powered air compressor to operate greasing units, put air in tires and similar tasks. It carries six 100-pound drums that contain engine oil, gear oil and heavy grease. It can travel up to 50 miles an hour and is built so it won't tip over in following other Army vehicles over rough terrain .

The tire repair shop is designed to handle tires on the move—patching up punctures and impact breaks while the convoy continues.

And the water trailer is fitted with two large spigots for quick radiator filling. Four smaller spigots are used for filling canteens of thirsty drivers. A long suction hose and a pump permit operators to refill the trailer's 250-gallon tank in about 20 minutes.

(U.S. Press and News Releases)

" . . . The flame of the sporting spirit must be applied to the training of troops. We must put to good use the eager strength and skill exerted in so many fields of activity, the desire to excel which is so dear to the young, the fame with which public opinion endows champions; in short, the immense expenditure of energy and enthusiasm allocated by our era to physical effort and competition. Essentially, nothing lends itself better to the taste for sport than a military career. There is no single military operation which does not call for skill, energy and self-control. There is no single warlike action which is not a collective test and does not demand the concerted action of well-trained teams."

General Charles de Gaulle, in 1934;
Toward a Professional Army.

Foreign Military Digests

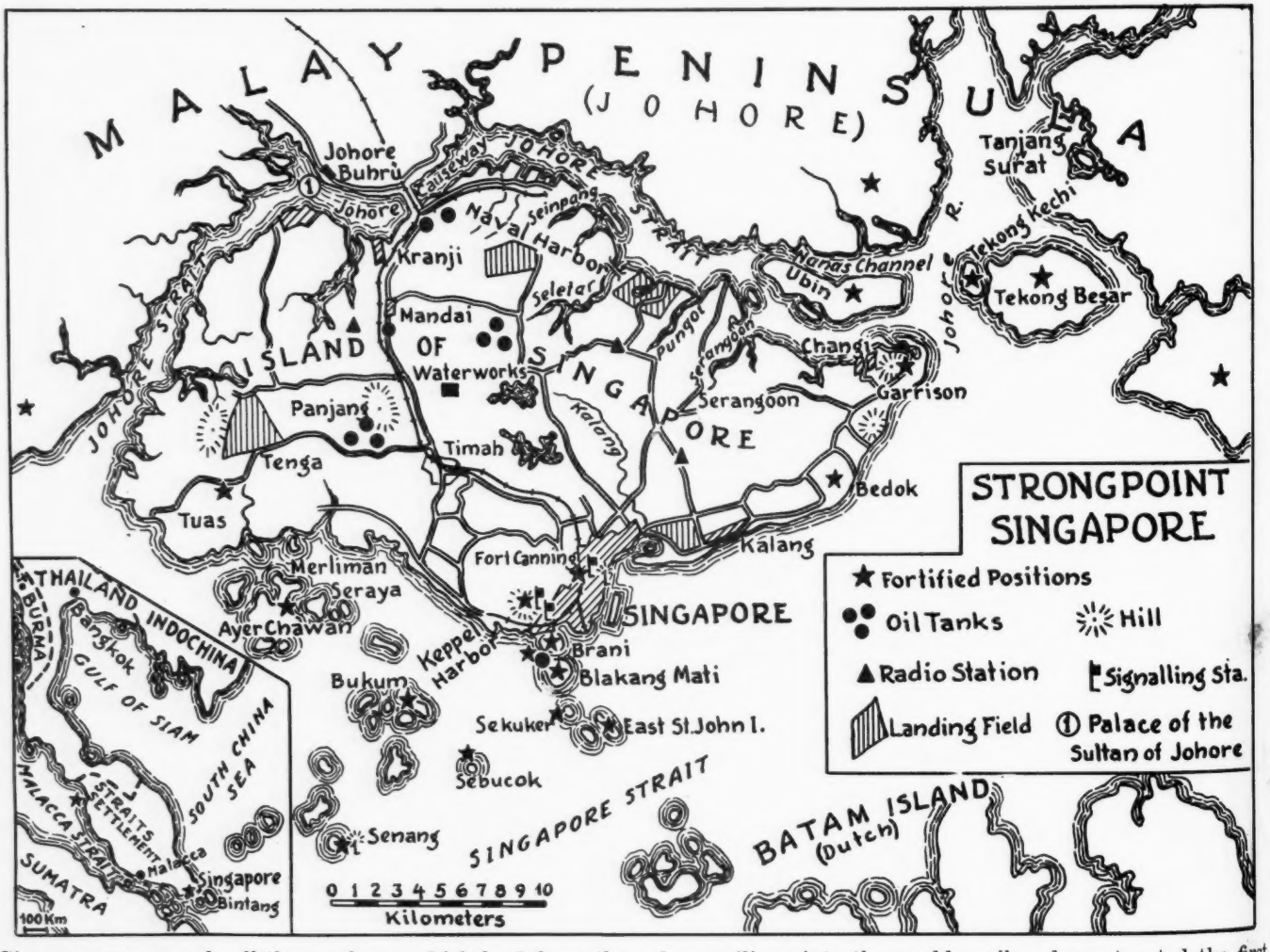
Digests of articles from foreign military periodicals; other items of interest from foreign publications are summarized in the Catalog of Selected Periodical Articles.

Singapore—British Naval Base

["Der britische Seestützpunkt—Singapore," by Lieut. Colonel Mlaker, in *Militärwissenschaftliche Mitteilungen*, May 1941. Translated from the German and condensed at the Command and General Staff School, Fort Leavenworth, Kansas.]

When Sir Stamford Raffles, British governor of Java, acquired the little port of Singapore for England in 1819, no one probably suspected that, in time, the strongest of Great Britain's ocean bulwarks would arise from this swampy, fever-infested stretch of primeval forest.

Occupying an extremely favorable military and geographical location—at the eastern end of the Malay straits—Singapore commands all the sea lanes which lead from the Indian Ocean to eastern Asia by way of these straits and to Australia by way of the Dutch East Indies. The British sea bulwark is supported to the greatest extent herein by the favorable location of Sarawak, British Borneo. Between Singapore and the Dutch islands of Batam and Bintang to the south, the "Straits of Singapore" narrow down to about nine and a half miles. They can, therefore, be easily blockaded at any time. Mine fields have lately been laid for the purpose of protecting the strong point from surprise attacks. Thousands of coolies cleared away the rank vegetation and tree growths of the primeval forests, drained swamp lands, drove pilings into the muddy soil and constructed the first fortifications.



In 1824, Singapore was "bought" for a song from the Sultan of Johore and declared a free port. Thereby it became the main base of the East India Company in its trade

between most densely populated China and India. This city, of such importance in world commerce, and whose significance has increased by leaps and bounds since the building of the Suez canal in 1869, is situated in the southern part of the mountainous and forest-covered Malay Peninsula. Specifically, it is on the southern coast of the hilly island of Singapore, about 14 by 25 miles in dimension. The latter is separated from the mainland by the one-half to two-mile-wide dredged Strait of Johore and connected with it only by a rock causeway. Its 660,000 odd inhabitants include some half million Chinese, 80,000 Malays, 60,000 East Indians, 7,500 Eurasians, 10,000 persons of other nationalities and only 12,000 whites. The city of Singapore itself has some 588,000 inhabitants. Today it is the seat of the governor and the capital of the "Straits Settlement," whose total area includes about 1535 square miles and has about 890,000 inhabitants (about 575 to the square mile). This British possession consists of the island and city of Singapore, Penang, Malacca and a few other areas. The remaining regions of the peninsula of Malacca, due to their political, economic and strategic significance, were made dependents of England, as protectorates. Since both the island and city of Singapore lie close to the equator, they have a tropically-humid, forest climate. Two major rainy seasons prevail. The mean, annual summer temperature is 29 degrees Centigrade; winter, 25.7. In the adjoining seas, devastating typhoons are much feared. The trade is mainly transit and transfer, but of recent years its own domestic trade has been on the steady increase (exports: rubber, spices, copra, tin; imports: coal, petroleum, food stuffs and manufactured goods). The world's greatest tin smelter is situated on the island of Brani not far removed from the city of Singapore. Singapore was once the greatest rice market in the world. Pineapple plantations cover broad expanses of the island of Singapore.

The sea trade of the entire colony, of which Singapore had the greatest part, was around 31 million tons in 1936-1937. Great Britain enjoyed thirty-two per cent of this, Netherlands 24 per cent, and Japan 18 per cent. It also played an important role in air traffic. The city itself stretches to the northeast of the well protected and deep harbor. The nucleus of the city, aside from the harbor, is formed by the modern business section, government buildings and the Raffles Museum. South of the harbor is the Chinese quarter. To the north are Malayan and other native quarters. To the west, on the landscaped slopes at the outskirts of the city, are the bungalows of the Europeans. Greater than the commercial or economic importance of Singapore is its strategic importance. As early as 1921, England began the work of fortifying the base in modern manner and the construction of a naval base for her own use capable of providing for a fleet of the heaviest type of ships. The new naval base area extends along the north side of the island, well protected, between the Johore causeway and the Seinpang river. All battle fleets of the world could ride at anchor at the same time in Singapore harbor, which is protected by the strongly fortified islands of Brani, Blakang Mati, and St. John. The average depth of the harbor, more than 18 meters, has been increased by dredging, to enable battleships to anchor. With its breakwater, Keppel harbor provides good protection. The old Tajong-Pegur dry docks for light cruisers are located here.

Among the conveniences of the naval base at the north is a floating dock with a lifting capacity of 50,000 tons, large enough for the largest British battleship; also a gigantic dry dock large enough to hold two of the largest warships at the same time. Other dock structures, piers, numerous storage and warehouses are also to be found here. The entrance to the naval base is protected by strong fortifications, especially on the islands at the mouth of the Johore river. Additional carefully camouflaged fortifications are scattered over the entire island as are also oil* and drinking water reservoirs both above and below ground; four large air fields, radio stations, ammunition stores and many other similar installations. An excellently planned highway system, with the necessary railways, connects all the installations, often difficult to recognize. The oil is brought in from the Bahrein Islands, Sarawak and the Dutch Indies. Coal and petroleum are brought from India or the Malay states (Burma). The coal bunkers are reported to hold 250,000 tons.

Before the start of the present war, Singapore had a garrison of around 12,000 men. The garrison is located at Changi, at the northeast tip of the island. Several squadrons of airplanes and the main body of the British East Asiatic fleet were always kept at Singapore. Only full-blooded Englishmen were permitted to pilot boats through the numerous cliff-like rocks and islands which protect the entrance to the harbor.

In the triangular, oceanic support point comprised of Singapore, Port Darwin (on the north coast of Australia) and Hongkong (in the South China Sea), Singapore was to occupy the leading position. Hongkong has even now been crippled as a naval support point in the occupation of Canton and Heinan by the Japanese. England no longer counts on it. Port Darwin is about 2200 miles from Singapore with a maze of islands between them. Even before the war, experts in England had doubts as to the real value of Singapore.

*By 1936, the stores of fuel oil totalled one and one-half million tons.

Russian Air Power

THE STRATEGIC PLAN

[Condensed from an article in *The Aeroplane* (Great Britain), 18 July 1941.]

Problems of air strategy and tactics have a great appeal to the speculative Russian mind. Russian military and aeronautical journals have discussed this branch of military science in more detail than publications in any other country. German periodicals such as the *Militär-Wochenblatt* and the *Luftwehr* have devoted much space to translations of or abstracts from Russian articles dealing with air warfare.

A survey of the German air operations of the present war suggests that most of them have been modelled on the Russian Regulation whether they were independent air force operations or collaboration with the ground forces. This is not surprising if one keeps in mind that most of the prominent Luftwaffe Generals, such as Keller and Student, learned their first lessons in aerial warfare in Russia before 1933, when the German and Russian High Commands worked closely together on building up their armed forces.

The Russian Regulation deals with both independent air force operations and with the collaboration of flying units with ground troops. The first part is modelled on Douhet's teachings. The heavy bomber force as described in *Il Dominio dell'Aria* stands in the foreground, but the Russians take into account the changes in air warfare arising from technical development. The light bomber plays a vital part in these independent operations.

Army Cooperation

The second part of the Regulation is the more interesting. The great battles of this War launched by the Germans seem to have been modelled on it; and examples of its operation are the breakthrough at Sedan and the German thrust towards the Channel ports. Had the Regulation been as thoroughly studied by the Allies as it was by the Germans, they might have learned how to use their defending forces against the Stuka-Panzer onslaught.

"The principal task of an Air Force, when not engaged in independent operations, is to help the Commanders of the ground troops during their operational movements." That is the principal maxim of the Regulation. The Air Force, like the Army and Navy (it asserts), is part of the armed forces and as such is under the command of the Commander in Chief who has to decide what kind of operations are necessary. When airplanes are detached to support Army units, the Army commander is in charge of operations, and the commanders of the Air Force units, tanks, and artillery formations have to be at his headquarters in order to speed up collaboration. If, on the other hand, the operation is mainly an Air Force operation to which the Army has to give support, the Air Force commander is responsible for the execution of the orders.

The Germans seem to have accepted this principle without reservation. During the battles of France and the Balkans, the Army commanders directed the operations of the ground troops and of the Luftwaffe, while in the Crete campaign Army and Naval units were under the command of Göring. Even the mountain troop division which was brought to Crete received its orders from a Luftwaffe officer, General Student, Commander of the Parachutist Division.

This system worked very well, and the discussion whether an Air Force is an independent branch of the armed forces or only an assistant to the ground forces seems, therefore, to be of only academic interest. Russian military literature between 1932 and 1937 is full of studies of this problem.

When the resistance of the enemy cannot be broken by the fire of the infantry, artillery or other ground troops, air force support must be called in. This can be done not only by the Commander in Chief of the sector, but also by lower commanders—even by officers commanding small tank units. The strength of the Air Force units to be sent to support these operations depends on the importance of the single operation. The cooperating air force formation has to be used in mass attacks on enemy objectives; dispersal of machines must be avoided as only superior numbers and surprise can overcome a stubborn opponent.

Primary Targets

The task of the cooperating air units is twofold: to protect their own ground forces and to attack important targets in and behind the enemy's lines. Typical targets are marching units, troop concentrations, railways and other communications, airdromes in the battle and tactical zones. A "rolling" attack on all these objectives can be achieved

only if the flying units are highly mobile, and this mobility can only be attained by preparing sufficient airdromes and supply bases built by the Army. Dummy airplanes and camouflage have their places in the scheme, too.

Dive-bombers, airplanes for ground attack, light bombers, and fighters have to operate in the battle and tactical zones. The first two groups have to intercept the enemy's ground troops and to attack his positions, his supply organizations and his airdromes. They have also to destroy his command positions to interrupt communication between the commander and his troops. During the Yugoslav campaign German dive-bombers concentrated attacks on the headquarters of the enemy Commander in Chief, with the result that he lost all contact with his Army. The light bombers' work is similar to that of the dive-bombers, but they have also to make tactical reconnaissance flights.

Bombing in Depth

Fighter sweeps on a large scale to destroy enemy airplanes on the ground and antiaircraft batteries where strong enemy fighter resistance is expected were specified in the Regulation. Fighters have to protect their own advancing troops, gun emplacements and antiaircraft artillery positions and other objectives against enemy air attack. No dive-bomber mission must be undertaken without fighter protection when enemy air opposition might be met. Air reconnaissance and artillery spotting must be protected by fighters. "One photographic plate is often more valuable than two fighters," remarked a Russian commentator.

To overcome a stubborn enemy the attack must be directed against the entire depth of his positions. If high explosive or splinter bombs are ineffective, gas bombs have to be used additionally. Such an operation, however, is very difficult and has only to be entrusted to well trained, experienced units.

The Regulation as it stood when the War broke out dealt with both offensive and defensive collaboration between tanks and airplanes. Tank or armored unit attack must be preceded by an artillery bombardment of the first defense lines and a bomb attack on the enemy's reserves. At zero hour, dive-bombers and ground attack airplanes have to lay a "fire curtain" around the advancing tanks, while fighters have to protect both against surprise attacks. Reconnaissance machines have to inform the Commander and the tanks of the progress of the attack and the presence of enemy armored units.

The commander of the smallest ground troop or Air Force unit has to understand the ideas underlying such operations and to be able to use his own initiative.

Scanning the Mountains

Of equal importance is the work of the cooperating Air Force units if the enemy succeeds in breaking through or, by an outflanking movement, appears unexpectedly in the rear. In the event of a breakthrough, says the Regulation, a counterattack, if possible, supported by aircraft, must be made at once to close the gap and to stop more troops from pouring in. Then, tanks, armored cars or motorized units and artillery, as well as dive-bombers, have to be entrusted with the task of destroying the forces which have broken through. Simultaneously, concentrated air attacks have to be made against the enemy's reserves.

In mountain warfare, airplanes are of great use for reconnaissance, transportation and communications. Dive-bombing of mountain positions is considered largely ineffective. In forest battles, which are raging at present, strong support from the air is necessary. The Regulation suggests the firing of the woods by means of incendiaries in order to rid them of well-screened enemy artillery. In village or town fighting ground forces must never attack before dive-bombers have destroyed all possible strongholds of the enemy.

Hints for AA Gunners

One reference only need be made to the tactics of the antiaircraft artillery. Should a single enemy airplane, obviously on reconnaissance, approach antiaircraft positions, there is no need to fire at it if the batteries are well camouflaged and fighter protection is available. If the antiaircraft artillery commander is not convinced of the efficiency of the camouflage, or fighters are not available, he may order half a battery to open fire against the enemy machine. As soon as firing has ceased, the entire battery must change its position at once and dummy guns, if they are at hand, may be installed to mislead the enemy.

How far the teaching of the Regulation has been absorbed by the Russian armed forces only the actual operations can prove. Germany, at any rate, has shown its complete understanding of the principles laid down by the Russian military theoreticians.

Reconnaissance

[From an article by M. Zakharov, in *Krasnaya Zvyezda*. Translated from the Russian in the Translation Section, The Army War College, Washington, D. C.]

What are the functions of reconnaissance agencies in a mobile action in a war of movement? First of all, it should be pointed out that in assigning missions to reconnaissance detachments, these should not be restricted as to their direction, or area. Comprising mobile forces and operating within a zone of about 4 to 5 miles, the detachment will itself easily locate openings within the lines of natural barriers and on the flanks of the hostile security forces.

The patrol serves as the eyes of the reconnaissance detachment. Proceeding from one point to the next, the patrols sweep from their path the scouts of the enemy. Upon encountering stronger security detachments with antitank weapons, the patrols make every effort to locate the flanks or openings. They determine the location of these and report them. It is here, in the free passage to the main forces of the enemy, that the reconnaissance detachment then gets under way. In the case where there is no such opening or flank, i.e., where there is no opportunity for any further freedom of movement, the main force of the reconnaissance detachment then goes into action.

Upon causing a breach in the hostile disposition, the commander of the reconnaissance detachment sends out a new system of patrols while the patrols previously employed that have been delayed by the hostile security detachments, disengage from their action, and proceed to join the main body of their detachment. The patrols are required to make every effort to locate the hostile main forces and to maintain constant observation of the battlefield. On encountering

the fire of the enemy, they must continue to maneuver and to dart about beyond the effective range of the hostile fire. When the objective has been reached and the first messages of the passage of certain points and of the establishment of contact with the enemy have been sent back, the commander of the detachment endeavors to learn and to report on the most important matter, namely, the composition of the main hostile forces, the time, place and direction of their movement, or their disposition. And it is particularly here that nearly everything depends on the speed of action.

On encountering an enemy on the march and after penetrating the zone of advance of one of his columns, the reconnaissance detachment determines the length of the column. The word "determine" must not be understood here to mean that the detachment remains several hours at one point watching the hostile column. Upon discovering the head of the column, it endeavors to get to the tail of the column. On sending back messages concerning the size of the column, the reconnaissance detachment sends out patrols on parallel roads in order to determine whether these roads are free or whether they are occupied by the enemy.

The proper initiative of the reconnaissance detachment will enable it to locate the exposed flank of the enemy. Now, the principal task before the detachment is to stick at the flank and under no circumstances to abandon the enemy. Hostile outposts, on discovering the patrols or individual tanks of the reconnaissance detachment, will immediately report them, and the enemy will hasten to do away with the obtrusive reconnaissance. However, neither the infantry nor the cavalry will prove effective against the mobile action and armored equipment of the modern reconnaissance detachment. The artillery will be more dangerous, but even the artillery weapons should not be able to drive the patrols back further than one kilometer.

The reconnaissance detachment engages the enemy in action and continues on its mission. In the event that farther on there appears another hostile column, the reconnaissance detachment at once shifts its attention to it. In a word, the mission of the reconnaissance in mobile warfare and meeting engagements is to determine as far as possible the disposition of the hostile forces, to the end that the enemy may then be attacked and defeated in detail. It is essential to disrupt the plans of the enemy, to compel him to abandon his active undertakings, and at the same time to prevent him from learning our own plans of action.

Closest attention is required in the reconnaissance of a defensive zone. Even before the beginning of the action against the hostile security forces, corps aerial reconnaissance is required to determine the disposition of the enemy, the presence or absence of obstacles, and the nature of the same, the disposition of the hostile artillery and reserves. Aerial reconnaissance is conducted without interruption, day and night, until the conclusion of the battle, with the object of observing any changes in the area of the hostile defensive zone, in the hostile reserve area and on roads leading to the defense zone from the rear. In view of the special requirements imposed upon the aerial reconnaissance during this phase, the depth to which it is conducted from the main line of resistance of the defense zone extends up to two days' march.

The corps commander adopts the first important plans with respect to the disposition of his forces for the attack on the basis of the information supplied by the aerial reconnaissance. Special importance therefore attaches to the proper assignment of missions to the air forces engaged in the reconnaissance and to the verification of the information in question by the flight of staff officers in connection with it. The moment that the aerial reconnaissance determines the location of the main hostile forces, the efforts of the divisional reconnaissance get under way. Small groups of the reconnaissance detachment infiltrate through hostile security forces, vigorously reconnoitering the hostile main line of resistance, or the barrier zone before it. The battle reconnaissance of the main line of resistance involves the further development of the advance guard action and the seizure and maintenance of important points within the dispositions of the defender. The reconnaissance should establish the nature of the hostile resistance and the disposition of fire weapons.

In the event that night should intervene before the attack, it is essential to organize a night reconnaissance of two categories: The first—to capture vital points or to ascertain whether on not the enemy is undertaking any movements under cover of darkness. The second—for the purpose of destroying hostile security forces and taking prisoners. Of much importance in the circumstances is also a secret officers' reconnaissance for the purpose of determining more fully the location of barriers before the main line of resistance and at approaches. At daybreak, reconnaissance once more duly establishes the disposition of hostile artillery positions. The most important mission, though, of all forms of ground reconnaissance—officer, staff officer, mechanized, artillery, and engineer reconnaissance—is, of course, that of establishing the antitank system of defense of the enemy.

The collection of information with respect to the antitank defense is the responsibility of the chief of the intelligence section of the particular headquarters and is conducted under the personal observation of the chief of staff. In its execution, provision is made so that at the time of the launching of the attack, all discovered obstacles, the points of the probable location of hostile antitank guns, and information bearing on the antitank defense are entered on the maps of not only the tank troops, but also on those of the infantry, artillery, engineer officers, or flight observers accompanying tank troops. Obstacles observed by the reconnaissance in front of the main line of resistance are destroyed by the infantry and sappers.

Active reconnaissance efforts must be conducted within the zone of each division and, within the latter, in the sector of each regiment, so as to prevent the enemy from determining in advance the direction of the main effort. Each staff of general units and special services must maintain personal observation of the battlefield and of the action of reconnaissance units—preparing reconnaissance data received on the spot.

In organizing a defense position, it is important for the commander to know the distance of the enemy from it, the particular area in which the enemy is concentrating his main forces, what units are situated before the defense front and the time when the enemy is intending to launch his attack. In order to obtain this information, the corps commander orders an aerial reconnaissance. Divisional commanders send out reconnaissance detachments in the more important areas, and reconnaissance groups and separate patrols in

the less important areas. Regimental commanders designate dismounted and mounted reconnaissance elements, and provide for dismounted daytime and night scouting parties, up to a distance of five kilometers.

Withdrawing to the line of security forces, the reconnaissance detachment makes every effort to incite the enemy and to lead him under the flanking fire of the security forces. The reconnaissance detachment must be thoroughly familiar with the friendly barrier zone, the location of friendly security detachments, passages and obstacles. The reconnaissance detachment, however, cannot be assigned defensive missions against the reconnaissance and advance units of the enemy. An exception to this may be where the reconnaissance detachment operates jointly with the security forcs.

Hit Where It Hurts Most

[Digested from an article by E. Sykes, in *The Aeroplane* (Great Britain), 16 May 1941.]

The process of analysis in this article is the same as in our "Air Estimate of the Situation." We arrive at the same conclusion in all of our estimates from the viewpoint of the "big picture." The same *process* is necessary to arrive at the most profitable target in any "small picture"; i.e., in a particular theater or with a particular task force.—*The Editor.*

The Royal Air Force has dropped bombs on all kinds of targets, arms works, oil refineries, railways, barges, etc. Our policy appears to be to spread our attacks over as many districts and as many different kinds of objectives as possible. To obtain the best results from our efforts we should concentrate all our raids on those targets where they can do most damage per bomb, or rather, per airplane journey.

As an elementary example of this, machine guns are more powerful weapons than rifles, therefore we should not bomb any rifle factories until all machine-gun factories have been destroyed. We can think of more powerful weapons than machine guns, and then the choice is not so obvious. We must also consider things other than weapons, such as oil, transport, etc. This brings us to what should be the first principle of air strategy:

(1) Drop all your bombs where they hurt the enemy most. If it hurts the enemy most to drop our bombs on airplane factories, then we should drop all our bombs on airplane factories. How are we to decide which is the most valuable target? First we must establish other principles of air strategy.

For the purpose of an example, suppose that we decide that airplane factories are the most valuable targets. I am not suggesting at this stage of my argument that they are. There are two main types of airplane factories—those which make aero-engines and those which make airframes. It is not necessary to bomb both of these. Provided that we bomb all aero-engine factories, then the airframe factories are useless, or vice versa, because it is no use making areo-engines if you have no airframes to put them in, and it is no good building airframes without engines.

This method of approach can be greatly elaborated. In addition to factories making engines and frames, you need steelworks and aluminum works and many others, and before the airplane can fly it needs an airdrome and some oil.

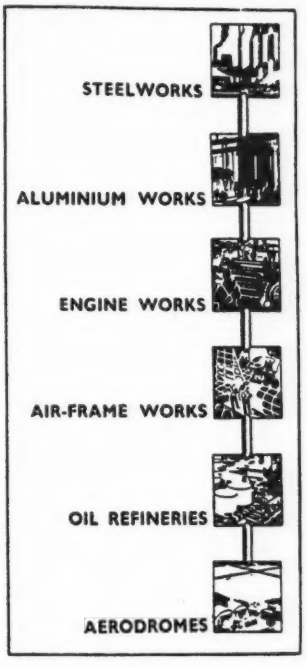


FIGURE 1.

Some of these items, sufficient for illustration, are given in Figure 1, where each item is shown as a link in the chain of processes required to make and use an airplane.

If we use our bombs to destroy any one link in this chain, the airplanes either cannot be made or cannot be used. It is only necessary to destroy one link in any one chain to achieve full effect over the whole chain. To attack a second link in the same chain would be a waste of time and would not conform to our first principle of air strategy. This enables us to lay down another principle:

(2) Attack only one link in any one chain.

We should, of course, use some discrimination in our choice of a suitable link. For example, choose some link

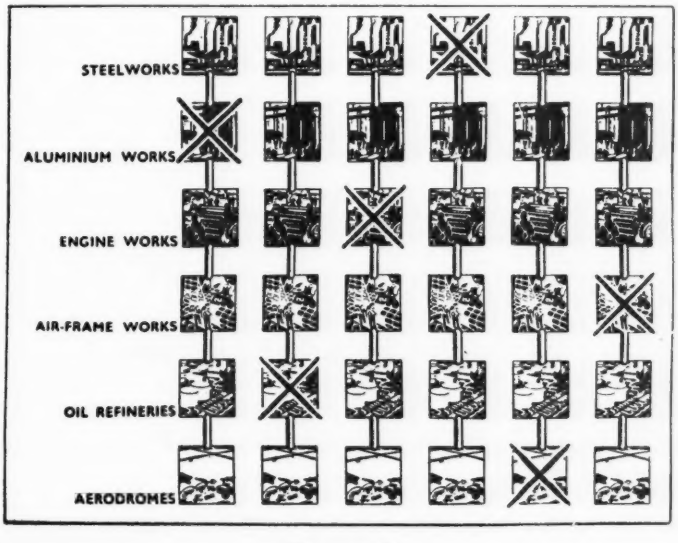


FIGURE 2.

which is easy to attack. There are some links, as explained later, which cannot be entirely destroyed, and these should be left alone in favor of some link which can. Usually there are several chains in parallel, as in Figures 2 and 3. This is because several kinds of airplanes are being made. There are, shall we say, half a dozen different factories making engines, half a dozen oil refineries, and so on. Most of these are interchangeable. For instance, the engine works can obtain steel from any of the six steelworks. An airframe can be fitted with more than one make of engine, and so on. Figure 2 illustrates what the R.A.F. bombers are doing now.

They are dropping their bombs on some aero-engine works, but not all engine works; on some steelworks, but not all steelworks; and so on. Therefore Figure 2, which is sufficiently accurate to serve as an illustration, shows that the enemy still have five-sixths of their production of steel, five-sixths of their production of aero-engines, etc., which means that they still have five-sixths of their production of airplanes. In contrast, Figure 3 shows what we could do with the same number of bombs. If we concentrate all our bombs on one class of target, and cause an entire loss of production in that one class, that would mean an entire loss of production of airplanes, instead of merely one-sixth. The same applies to the manufacture of all other things, in addition to airplanes.

(3) Where there are several similar chains (as there usually are), destroy the same kind of link in all the chains, to prevent the chains from supplying each other's deficiencies.

We can elaborate this method of approach further by considering the manufacture of two different things, say, airplanes and tanks, for which we can use Figure 4.

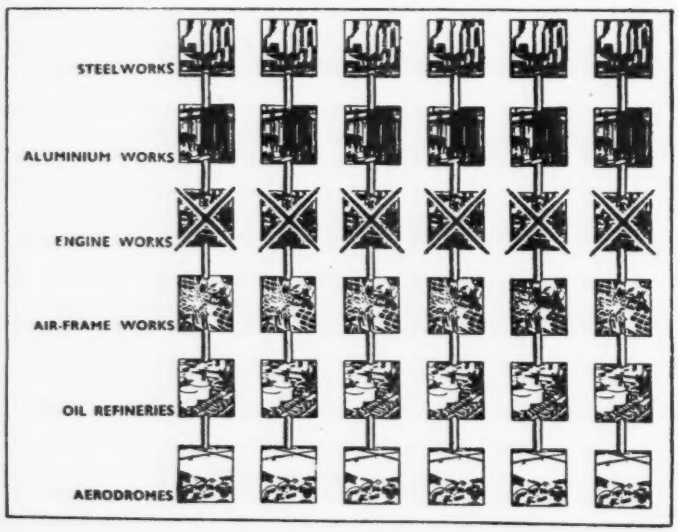


FIGURE 3.

There is one thing to notice here. The steelworks which supply steel for aero-engines also supply steel for tanks, and although airplanes use petrol and tanks use oil, the same refineries produce both. There are thus some links which appear in more than one kind of chain. If, therefore, we choose a common link, and drop all our bombs on steelworks instead of aero-engine works, we can cause an entire loss of production of both airplanes and tanks.

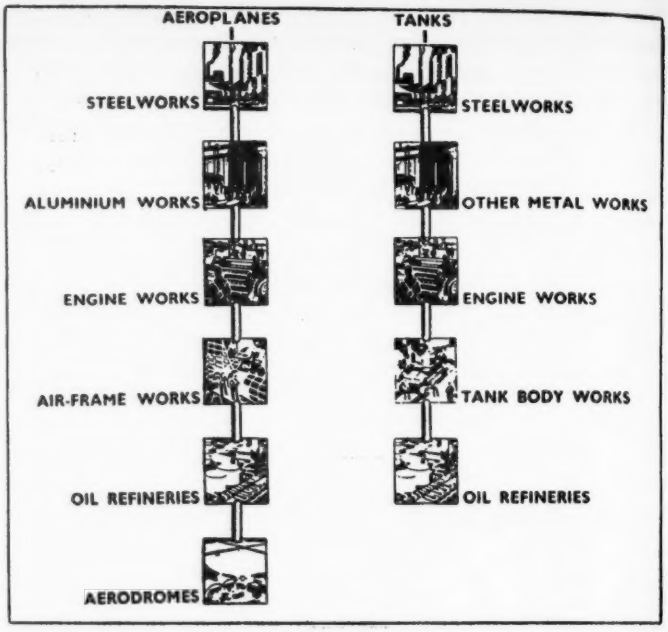


FIGURE 4.

(4) Choose that link which is found in the greatest number of different chains, and attack all those chains together in that one common link.

Indirect damage can be far more extensive than any direct damage that a bomb could do. Now our problem becomes one of finding what class of target would cause the most extensive indirect damage. We are prompted to ask: is there any one link common to all chains? Is there any one class of target which if totally destroyed would bring all activity in Germany to a standstill? There is; in fact, there is more than one.

Steel, transport, electricity and oil are represented in nearly every chain. We must not bomb all these four, because, as explained above, we should bomb only one class of target, at least until all the targets in that class are destroyed. Moreover, we must decide which of the four is the most valuable, because, as explained earlier, we should concentrate all our bombs where they hurt the enemy most, to the total exclusion even of the second best.

Steel.—If all steelworks were destroyed, the enemy would still have large stocks, and could import steel from neutral countries. Therefore we cannot achieve complete destruction of steel.

Oil.—This is similar to steel, regarding stocks and imports. Even if all oil refineries and oil stocks were destroyed, imports would still be sufficient to keep the submarines and bombers in operation, and these two enemy weapons are by far the greatest danger to our cause.

Transport.—When we drop bombs on railway junctions and marshalling yards, repairs take only a few hours. The workmen merely fill up the holes and lay new rails from stock. Such damage is of a quite temporary nature. Railways form such a complicated network that to cause total interruption of traffic bombs must be dropped in a thousand places every day.

Electricity.—It takes two or three years to build a new power station. Electricity differs from everything else, in

that there can be no stocks and no imports. This means that electricity is the only thing in which destruction can be complete. The electricity link occurs in nearly every chain. This, then, is where we should drop our bombs, if we want them to have the maximum effect.

Bomb the power stations until they are all completely destroyed beyond hope of repair.

New Aspects of the War in the West

[Condensed from an article by "The Spectator," in the Russian *Krasnaya Zvyezda* 4 December 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D. C.]

In the years following the World War, in all of the imperialistic armies, the quantity of mechanical equipment, airplanes and tanks in particular, was greatly increased, while the technical and tactical qualities of these were immensely improved. Large motorized and mechanized divisions were created, along with air landing units—Germany leading all other bourgeois countries in this respect. The extensive utilization of the motor afforded the modern massed armies and their supply organizations the necessary mobility. All this made it possible to organize the offensive on a new basis and to insure swift action; armies once again attained the freedom of maneuver which they had lost in the labyrinth of the trenches of the first World War.

The particular aspect of the present day operations proceeds from the fact of the tremendous utilization of mechanical weapons of all sorts by the military forces. It is natural to assume that the increase in mechanical weapons produced the basis for changes in the forms and methods of the conduct of war. Compared to the first World War, the military undertakings in the west are characterized by a series of essential new features. The tremendous *quantitative* increase in mechanical weapons has brought about *qualitative* changes in the forms and methods of combat.

Within the recent phase of the war in the west these changes found more vivid expression in the progress of the offensives there.

The *first factor* involved in these offensives is the greater speed of action. It will suffice to recall the fact that in the war of 1914-1918 (in its war of movement phase) the speed of offensive undertakings, under most favorable conditions, did not exceed 9 to 11 miles per day. The rate of advance of an army was determined by the progress of the bulk of its infantry; naturally, the progress could not be greater than that of the average rate of advance of the larger units. As regards the final operations of the first World War (the decisive Allied advance, for example), the rate of advance during September-November 1918 amounted to an average of only two kilometers per day.

In the present conflict the Germans considerably increased their rate of advance. Thus, after the breakthrough of the Allied defenses on the Namur-Sedan front, German mobile units, in the course of five or six days, reached the coast—covering in this period, with fighting, over 125 miles.

Just what made possible this great increase in the rate of advance? Obviously, the main role was here assumed by the highly developed mobile means of combat, motorized and mechanized units especially. However, sight must not be lost of the fact that the Germans were dealing here with weak, poorly organized hostile forces that were not prepared for any serious, stubborn resistance.

The dizzy pace of the German advance was due at least to the superiority in mechanical military weapons, to the internal weakness of the enemy and to the better control of their forces.

The *second factor* in the present operations is the more extensive opportunities for effecting and exploiting penetrations. During the first World War, starting with 1918, i.e., with the beginning of position warfare, the attacker at no time found it possible to extend a tactical penetration into a strategical breakthrough. This was prevented in each case by the appearance from the rear of strategical reserves that arrested the progress of the attacker, and once more established a continuous front. At the present time, however, the mass employment of combat aviation, air landing detachments and motorized and mechanized units, renders it possible, by a swift accumulation of forces from the rear, to effect a penetration on a strategical scale. The action of the German forces in 1939-1940 repeatedly demonstrated this. True, the Germans were operating under conditions that were different from those obtaining in the position warfare period of the first World War. They were opposed by an improvised, hastily prepared defense front; they possessed a considerable superiority of forces, while, at the same time, their enemy had been demoralized and lacked the essential will to fight. Nevertheless, the success of the German penetrations is highly significant, inasmuch as it testifies to the tremendous potentialities of the modern military equipment when applied with due regard to existing conditions, and on a large scale.

The *third factor* involved consists of the availability of means that permit the organization of a decisive, crushing pursuit, which was completely absent in the first World War. Both in Poland in 1939 and in France in 1940, the Germans, in providing for the pursuit of the retreating hostile forces, accomplished the complete destruction of the enemy. The extensive, large scale employment of aviation, tanks, motorized infantry, along with the utilization of new crossing and bridging equipment, permitted the Germans, in their pursuit of the enemy, to overcome water barriers and to advance with unusual speed—overtaking in certain instances the retreating hostile forces and cutting off their lines of retreat.

The *fourth factor* involved is that in connection with the control of forces and the establishment of cooperation among them. Notwithstanding the enhanced scale of operations, their extent, uninterrupted nature and heightened speed, the modern means of communication render it possible, as demonstrated by the German army, to secure uninterrupted control of the forces. Thus, for example, during the operations in Belgium and France, the German field artillery refused entirely to make use of wire communications, which are easily interrupted in the course of action, and maintained reliable communication with its infantry by portable radio. Equally reliable communication was thus

also maintained among the mechanized forces and aircraft, that is a more difficult accomplishment. The moment tanks encountered strong resistance, there appeared at once over the battlefield the German aircraft, called out by radio—and paved the way for the tanks. Communications between higher headquarters were thoroughly reliable and uninterrupted at all times.

Such in effect are the basic, more important aspects of the present offensive undertakings. The war continues. The further progress of events, and the intensive development of the implements of war during the actual conflict, as was the case in 1914-1918, will doubtless hasten the process of the formulation of new aspects in the art of war.

* * *

As a matter of fact, is the present war a "blitzkrieg"? In general, what is meant by "blitzkrieg"?

As a consequence of the experience of the first World War, a score of different theories appeared with regard to the aspects of the next war. All these theories were based on the general assumption that the war must be swift and crushing. The theories involved, first of all, reflected the fear of the burgeoise of a protracted conflict that would be fraught with internal social disturbances. The concept was thus born and evolved with respect to the need for and the feasibility of the delivery of an annihilating blow upon the enemy so swiftly as to put him out of action in short order—the concept of the "blitzkrieg" or lightning war.

All this, however, was merely wishful thinking. The Napoleonic methods of action, wherein by means of a single decisive battle it was possible to crush an enemy and thus to bring the war to a successful conclusion, were no longer feasible and proved impracticable during the first World War; and are all the more impracticable under present-day conditions.

The "blitzkrieg" conclusion of a conflict in this imperialistic age is feasible only where the strength of the opposing forces is quite unequal and the encounter involved is of a local nature. But even in such conditions the conflict cannot always be concluded with a single blow. Any encounter among the major imperialistic powers inevitably threatens to develop into a general world war, in the course of which, with the collapse and elimination of defeated countries, new fighting fronts make their appearance.

Speaking of the aspects of the next (i.e., the present) war, Comrade Frunze pointed out fifteen years ago:

"In an encounter between first class powers, a decision is not to be expected by a single blow. The conflict will assume the aspect of a protracted, grueling contest that will strain every economic and political resource of the belligerents. Strategically speaking, this will involve a transition from the strategy of lightning decisive blows to the strategy of a war of attrition."

This prognosis has been fully confirmed by the progress of the second World War in Europe.

The war is already in its second year. As a result of the operations in the west, Germany has gained a series of successes. However, the question of a final victory by either side has not yet been decided. The swift crushing of France, facilitated primarily by the internal weakness of that country, has not led the Germans to a lightning (blitzkrieg) conclusion of the war. Today, as a year ago, the possible end of the war is still problematical.

Is it possible, in the circumstances, to speak of some sort of lightning (blitzkrieg) war? Certainly not!

As regards "lightning" operations, the military events in Europe have actually demonstrated the fact that a well trained army, possessing a numerical superiority and superior mechanical equipment over the enemy may, in a very brief space of time, achieve a decisive victory in a particular sector that may often be of considerable strategical importance. Compared with the first World War, wherein exhausting battles in the war of attrition for weeks and months failed to solve the problems of a strategical breakthrough of the front, the present offensive operations of the German forces, true, in entirely different circumstances, progressed at great speed.

It was natural that under the influence of the military events of the spring of 1940, there were many who were eagerly seeking to find the "secret of the success" of the German forces. And there were some who, contrary to all sound judgement, succumbed to the illusion that there existed some sort of universal "secret of success." This secret, as in some of the foreign journals, was seen by some of our own writers in the all-inclusive theory of the "blitzkrieg," which supposedly completely revolutionized the art of strategy and tactics.

Actually, no such universal theory exists or could exist.

It is quite obvious that the rational employment of forces with a proper adaptation of all their qualities and with due regard for the potentialities of the modern implements of war will make it possible, under certain conditions, to gain in a brief space of time decisive victories in certain military undertakings. But the method of the conduct of such offensive undertakings does not involve any standardized, stereotyped method, suitable for employment in any and all cases, and must vary in accordance with the particular situation.

How would the events develop in case the army advancing on the principle of the universal method of annihilation, i.e., on the "blitzkrieg" method, happened to encounter a hostile force of a strength equal to its own? In the circumstances, would the defender have met with inevitable destruction? It would be absurd to assume this to be so. And it is equally absurd to assume that there can be a method in the conduct of war capable under all circumstances of leading the forces involved to victory.

In this connection, we may well consider an interesting article of Colonel Shmarov in which he analyzes the potentialities of modern strategical defense, and, especially, the question of the employment on the part of the defender of his strategical reserves. Colonel Shmarov aptly points out that "the army that possesses strong strategical reserves, is well equipped with tanks and aviation, and has mastered the difficult art of strategical defense, may well parry the assaults and liquidate the penetrations of the enemy in modern warfare. If the tanks and motorized troops inserted into a penetration will encounter the mechanized and motorized reserves brought up against them, possessing powerful antitank weapons and supported by attack aviation and power-dive bombers, the attacker will hardly find it possible to duplicate the swift operations of the Germans of May and June, 1940."

We can hardly find fault with the above statement. But what then remains of the "blitzkrieg" theory? There remains the old truism: In order to gain a speedy, substantial victory, the attacker must provide a considerable, overwhelming superiority of forces over the defender. With such a superiority, thanks to the modern highly mobile implements of war (aviation and tanks, especially), the operations may be conducted at great speed and with devastating effect.

And so we return once more to what we have already said above: The present-day offensive operation possesses a number of new potentialities and includes certain essential features, but it is a long way from this to the exaggerated concepts of the "blitzkrieg."

The Tactics of the Blitzkrieg

[This is a digest from an article by Major M. P. Huthwaite, British Army, in *Journal of the Royal United Service Institution*, February 1941.]

The only way in which the blitzkrieg tactics differ from others is that they are arrived at, first by considering the principles of war and deciding to lay less stress on security than on the other principles. This is a logical thing to do, for security is a hampering principle. If too much weight is given to it, it must act as a drag on the remaining ones. Secondly, they are achieved by suitable organization and training and by instilling the blitzkrieg idea into all ranks of the army.

Here is an extract from a semi-official German publication: "The use of the word *blitzkrieg* has led people to imagine that it denotes a departure from recognized tactical principles, whereas it is in fact only an application of two principles recognized in every country:

(a) It is the task of all arms to allow the infantry to close with the enemy while still possessing the means to force a decision.

(b) All arms must contribute to relentless pursuit once the enemy's resistance has been broken.

Infantry is still the principal arm. The fact that tanks and the air force were employed so successfully in the present war that the infantry encountered little resistance does not detract from the importance of infantry who must still break down the final enemy opposition with its own resources. However exhausted the attackers may be, the pursuit must be close. Although armored fighting vehicles, aircraft, and mobile troops can help to turn tactical into strategical success, infantry has its role. It must push forward without regard to possible loss of touch on the flanks, the object being to prevent the enemy reestablishing themselves in position. In such action subordinate commanders, often left to their own resources, must act boldly and be ready to accept responsibility."

So much for the tactical principles of the blitzkrieg. It is now clear that there is nothing unusual about them. They are the same principles which guide us in our tactics. But the quotation hardly goes far enough, for it does not consider how the infantry should achieve their task of closing with the enemy.

There are two methods. First what we might term the linear advance. This is the secure way, for it visualizes a steady advance on the whole front with all units keeping in touch with those on their flanks and the avoidance of anything in the nature of salients or re-entrants in the line. In its way, it is sound, but bound to be slow and probably costly for it implies the use of unsuitable as well as suitable ground and entails the direct forcing of enemy strong points instead of their envelopment. Secondly, we have the infiltration method as practiced by Germany. In this case, the advance is made only over suitable ground, and the object is to penetrate on narrow fronts as opportunity offers. As the attacking troops do not have to keep in touch with those on their flanks they can push on to unlimited objectives. Command is decentralized, as it obviously must be. Great stress is laid on communications from front to rear, not to ensure orders getting forward but to ensure information getting back, so that the commander can use his reserves to exploit success. Both these tactical methods are known to and understood by the British Army, so we can assert quite finally that German tactics are fundamentally the same as ours.

Though the blitzkrieg as a myth is now exploded, we must still acknowledge our admiration for its effectiveness. It gives a practically realist basis on which to wage war. for instead of the slow cautious strategy of attrition which is liable to bring economic ruin and misery to victor and vanquished alike it shows us the way to the swift decision, the supreme effort in which the valor and even recklessness of comparatively few will mean ultimate safety and peace to many. One day the armies of the Empire will assuredly meet the armies of the enemy on the field of battle. At the moment we are supremely confident of one thing, that man to man the British and Imperial soldier is superior to the German. At the same time, we realize that we labor under two temporary disadvantages—shortage of equipment and lack of training, though we are speedily rectifying both. Once the German Army labored under both these difficulties, for prior to the rise of Hitler it was limited in size and composition by the conditions of Versailles. When its opportunity came, in the shape of the favor of the Nazi party and the nation, it took it with both hands. Out of the small army grew the mighty one which exists today—an army organized to meet the calls of modern warfare and imbued with a spirit of offensiveness and the belief that it could not be conquered if only it put its all into every operation which it should be called upon to undertake.

Let us then consider those factors which have enabled the Germans to achieve it, for from them we may learn lessons of value to ourselves. There is nothing defeatist in such study for the German Army is today probably the best in the world. If we can catch up on the lead which they have gained and become even equal in efficiency and technique we can rely on the individual spirit of our troops to give us the superiority in battle. For purposes of discussion we can consider the factors which have made blitzkrieg tactics possible to the Germans under the headings of:

(a) Organization; (b) Training; (c) Physical fitness; (d) Command and control; (e) Air support; (f) Discipline and spirit.

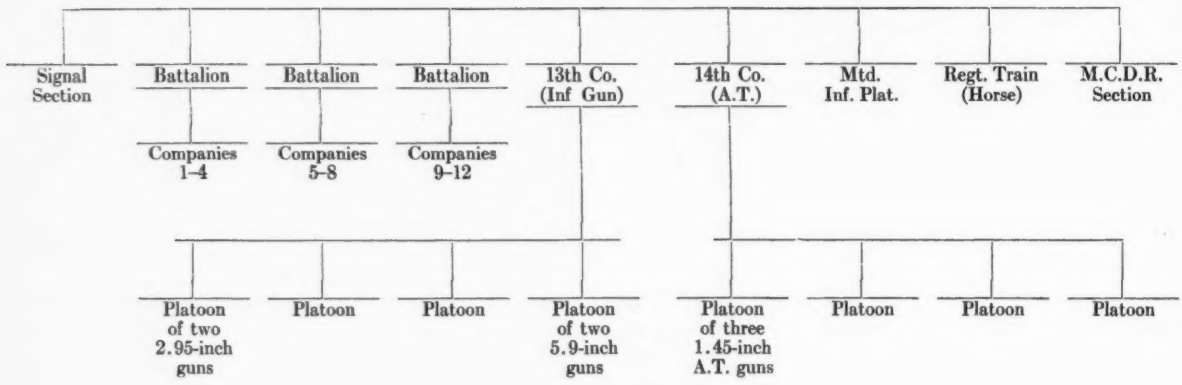
Let us consider each in turn.

Organization

Speed is an important ingredient in the blitzkrieg formula. Once battle is joined, the enemy must be hammered relentlessly and given not a moment's respite. It is, therefore, essential that supporting arms should be able to come into action very quickly when they are required. The German unit organization facilitates this quick support, for the regiment—which is the nearest equivalent to our brigade—possesses six 2.95-in. guns and two 5.9-in. guns, while the battalion has twelve machine guns (or dual purpose light machine guns on heavy mountings), six 3.16-in. mortars and forty-eight machine pistols in addition to the antitank guns, antitank rifles, light machine guns, and 2-in. mortars which are common to both armies. A chart showing the organization of a German regiment is shown on this page. It is fairly clear that, as they have artillery and machine guns as an integral part of the regiment, it is easier for the Germans to get quick support than it is for us.

What we have got to do, however, is to concentrate on getting perfect cooperation and understanding between infantry and gunners so that our divisional artillery can give support very quickly. It is suggested that we should be very chary about becoming too imbued with the barrage system of support. Barrages take some time to arrange and are very expensive in ammuntion—both great drawbacks if our attack is to be on the blitzkrieg principle; firstly because we cannot wait for the artillery to make a lengthy preparations; secondly because, if we achieve the success which we hope for, our advance will be too rapid for the building up of large ammunition reserves in the forward area.

ORGANIZATION OF THE GERMAN INFANTRY REGIMENT



ARMAMENT

36 MGs.	12 A.T. guns	18 3-inch mortars	2 5.9-inch guns
127 Lt. MGs.	27 A.T. rifles	27 2-inch mortars	6 2.95-inch guns
			48 Machine pistols

Training

The German is by nature meticulous in his attention to detail, and thorough. Both these characteristics can be seen in his methods of training for war. When he trains he really gets down to it. He is satisfied with nothing but perfection and, even while this article is being written, he is still training at full pressure, although he might reasonably be expected to rest on the experiences already gained in actual warfare. In the British Army we try to do the same, but we do not always find it so easy. We seem to have difficulty in finding time for the task of training the individual junior noncommissioned officer and private soldier. It was noticeable in the campaign in the Low Countries and France how proficient the individual German soldier was at his task. The lance-corporal in charge of a mortar had always reconnoitered and prepared a fresh position to which he moved when he was spotted. The corporal in charge of a section required to mop up an antitank gun carried out his out-flanking movement without hesitation and almost as a drill.

If we are to have an army which is trained to the last degree of perfection we must give the officers concerned a chance to do it. We must curb our enthusiasm for administrative organization and ruthlessly cut out anything which is not vitally necessary. It is for "operations" to take the lead. It is their duty to see that the army is trained to fight. They must try and act as a buffer between units and the well-meaning but misplaced and almost dangerous enthusiasm of those branches of the staff and services whose pleasure it is to see a well-ordered and highly organized life on peace-time lines.

Physical Fitness

If we wish to indulge in a little wishful thinking we can say that German manhood is physically poor, that lack of balanced feeding and over insistence on physical training in the Hitler Youth is producing a nation of poor stamina. That may be true, but only as a very long term policy —longer than we believe the war will last. What is also true is that German infantry divisions marched from 20 to 25 miles a day several days on end in the Low Countries and were in good fighting condition at the end of it. Let us emulate the German army views on physical fitness, where it is a matter of pride and principle for officers to set the men the example of restriction in smoking and drinking and of regular active exercise, including such pastimes as swimming rivers in service kit. The writer knows of one brigade in the British Army where it is a matter of principle that no one shall smoke before tea time, and of a corps headquarters where everyone covers a cross-country course each week.

Majors aged 40 or more and senior officers, including the corps commander, walk it, the rest run.

Command and Control

We have already discussed the way in which Germany decentralizes the control of supporting arms and pays great attention to the training of the individual down to the junior noncommissioned officer and the private soldier. As might be expected under such circumstances, command and control are also decentralized on the principle that the man on the spot can far more easily judge what action should be taken, and must be prepared to exercise his judgement and use his initiative. Great stress is laid on the need for initiative by even the most junior commanders. *Truppenführung*—the equivalent of our Field Service Regulations—states "mistakes and even disobedience are better than inertia," and again "better a faulty plan which shows boldness and decision than a perfect plan enmeshed in uncertainty."

The call to the commander is therefore clear. He is to make his decision and then act on it with the utmost energy. He must not be afraid of making the decision for, in a blitzkrieg, precious time cannot be wasted by reference to a senior officer. Such an outlook has many practical advantages. A German operation order consists largely of the intention. The method is left very much to the officers carrying out the operation.

This system is surely a sound one. The issue of a detailed operation order with a complicated method paragraph is excellent if the enemy does not upset the plan. Unfortunately he usually does and the situation is then immensely complicated for the junior commander. Is he to continue to stick rigidly to the dictates of the operation order, or is he to do what seems best to him under the circumstances? Let us, for a change, quote a British semi-official report on the subject: "The essence of German leadership is that the commander must always be well forward in order to appreciate the situation and to make his plan before giving verbal orders to subordinate commanders. During active operations, units below divisions do not issue written orders and more often than not corps and divisional commanders issue verbal orders. It is interesting to note that there is little evidence of orders written for war diary purposes or in order to fix ultimate responsibility for success or failure. When orders are given verbally, time is saved by framing them in simple and concise statements. Subordinate commanders on receipt of orders show that they have grasped their meaning by repeating them back using the first person. This practice is perfected during training. The commander appreciates and makes his plan. Verbal orders are issued and repeated by recipients, who then return to their units. The whole procedure is completed in a few minutes."

The matter can then be summed up by saying that in the German Army the subordinate commander is encouraged to assume responsibility and relied on to achieve results. In fact, command is decentralized.

If we are going to blitzkrieg the Germans ought we not to revise our views on the centralization of command, and the control exercised by our system of issuing orders?

Air Support

When our armies meet the German armies in the field, presumably the Royal Air Force will give to the army its fullest support and be used according to the wishes of the military commander, probably on the actual field of battle. If this is to be, as we sincerely hope it is, it is suggested that the fact should be announced at once so that during its period of training the army can practice the close cooperation with the R. A. F. which will be a big factor in achieving our ultimate victory. It it rather doubtful whether, at the moment, the army gives sufficient study to the question of air cooperation, yet it is a large subject and needs careful consideration. Army commanders and their staffs will be required to select priority targets for our heavy bomber aircraft; officers with units must be able to appreciate the capabilities of, and direct from the ground the activities of the dive-bombers. At the moment we think chiefly of passive air defence. We require a basis on which to study active air attack. [Recent announcements show that this is being done.—*Editor.*]

Discipline, Spirit and Morale

We all are mindful that discipline in an army is an essential to victory. We know, too, that we are facing a highly disciplined army which is part of a disciplined nation. Therefore, we ourselves need to achieve a high standard. The task is not really difficult because the British soldier is fundamentally sensible and honest. We need do only three things. First, ensure that the officers set the soldier the standard that the whole army should achieve. Secondly, explain to the soldier the reason for and the value of discipline. Thirdly, do all we can to keep alive in him the ideal of following a leader. The German Army have their *Führer*, and their admiration of him is no superficial thing but deeply engraved in their hearts. We have the King and we must try and put aside our native shyness and instill in the troops a fervor to serve, and an attitude altogether different from the flippant sensationalism or lush sentimentality with which the less reputable, but unhappily widely-read portion of our press deal with the matter of leadership.

Conclusion

We have considered in detail the ingredients necessary for the waging of a blitzkrieg. If we seem to have evinced some admiration for the German Army it is excusable, for they have shown their efficiency, not once but several times, and it is not the role of a soldier to indulge in petty jealousy or to turn a blind eye to facts. It is now for us to decide whether or not, when our time comes, we can wage a blitzkrieg and by the measured fury of our attack bring the war to a speedily successful conclusion. If we think we can we should all, down to the latest joined recruit, know that that is our object. We should all realize that we can only achieve this object by:

(a) Improving the cooperation between arms, and if necessary recasting our organization.
(b) Increasing the tempo of our training.
(c) Freeing ourselves from the hampering cords of excessive administration.
(d) Improving our physical fitness.
(e) Encouraging initiative in junior leaders, thinking less about correct procedure and more about ultimate results.
(f) Obtaining a clear statement of policy regarding the extent and form of air support which we shall receive.

(g) Improving discipline.

Finally, the writer would apologize if he appears to have remarked too often that such a thing "should" be done. It is easy to theorize on a subject, it is difficult to put theories into practice. Let the excuse be the realization that we are fighting for our very existence. The *Reich* is powerful, her morale good, her army strong, and her *Führer*, able. We shall not achieve victory if we indulge in complacent self-satisfaction and wishful thinking or if we dwell too much on our comfort. We must be willing, even eager, to criticize ourselves and discover our weak points, and then by our endeavors turn them into strong ones.

Tanks in a Sand Storm

[This is a digest of an article by Wilhelm Rueter, German war correspondent, in the "Lokal Anzeiger," 9 April, 1941.]

(This article would indicate that the African climate and terrain were something practically new to present-day German forces. However, supplies and supply installations appear to have preceded the tank units. Special precautions, it is noted, were taken to protect the tires from the sun by using rocks and dried grass.—*Editor.*)

"Men and machines are to be conserved until we arrive at the front. During combat both are to be used to the limit!" These were the words of the commanding general as his troops marched out of Tripoli.

During the trip across the desert, these words became clear. We experienced a sandstorm, the "Ghibli," the worst that can happen to man and machine during battle. Visibility was zero. When we encountered the enemy, he was only dimly outlined. However, our "tankers" had a good weather prophet among them and crews and machines took to available shade under the palm trees.

We continued the march without suspecting what was in store for us. The sun was clouded all day long. Thick, grey, ragged clouds chased across the sky—sand clouds reaching to a height of a thousand yards. The sky became as yellow as the sand itself. The horizon disappeared. The yellow changed to a glowing red. The air became more and more oppressive and, like the atmosphere finally relieving itself during a thunderstorm, a sand storm swept against us making visibility for our vehicles impossible. In spite of headlights, it was impossible to advance two yards farther. All the men and supplies for the front rolled along this road. A sand storm of this size extends a hundred kilometers. We halted. The fine sand penetrated all crevices. Within the vehicle we bound handkerchiefs over our mouths and noses. We stayed in the open nearly an hour taking the fury of the storm.

During the night the storm abated. In the morning we cleared the fine sand out of the vehicles with brooms and shovels. The motors were cleaned, direction indicators and windows were made ready for use again. After superficially cleaning our bodies, the march continued.

I had driven along this road fourteen days ago. But since then the entire operation base had been advanced more than 62 miles and it was a completely different picture today. Fuel and water transports rolled forward incessantly. "Aqua! Aqua!" was written on the large tank vehicles. "Water! Water!" The very word is reviving when read in the desert.

At the side of the road we saw small wooden signs: "Nearest watering place 4.5 kilometers," or "Gasoline tank 6 kilometers." That also gave us an impression of the widespread organization. The nearer to the front we came, the thicker became the depots, camps and storage places. We realized that everything was becoming increasingly concentrated. It was pleasing, after having seen only sun, sand and desert for hours, to discover an entire battery of field kitchens drawn up in line with their chimneys smoking. Occasionally we saw a motorized field repair shop with piles of wood for burning and construction purposes. All this was transported by motorized freight columns. Every telegraph pole erected by the signal corps must come across the Mediterranean from Italy and then be transported 250 to 375 miles into the interior. It gives the soldier a comforting and secure feeling to go into battle under such well-prepared conditions.

Munitions, fuel and water supplies were protected, since they lay so temptingly arranged in the yellow sand.

Rocks, or dried grass left by camel herds, were used to protect the tires against the heat of the sun. Our motors hummed along the asphalt road, and the massive underslung trailers for the heavy tanks were observed.

In our tanks we have a highly developed defense weapon which is the best guarantee for breaking hostile resistance and mastering the climate.

Medical Problems in Flying

[The source of this digest is *The Aeroplane* (Great Britain), 28 March 1941, which was taken from "Preventive Medicine in Relation to Aviation," the presidential address given by Air Vice-Marshal H. E. Whittingham before the Royal Society of Medicine in 1939.]

"Blackout"

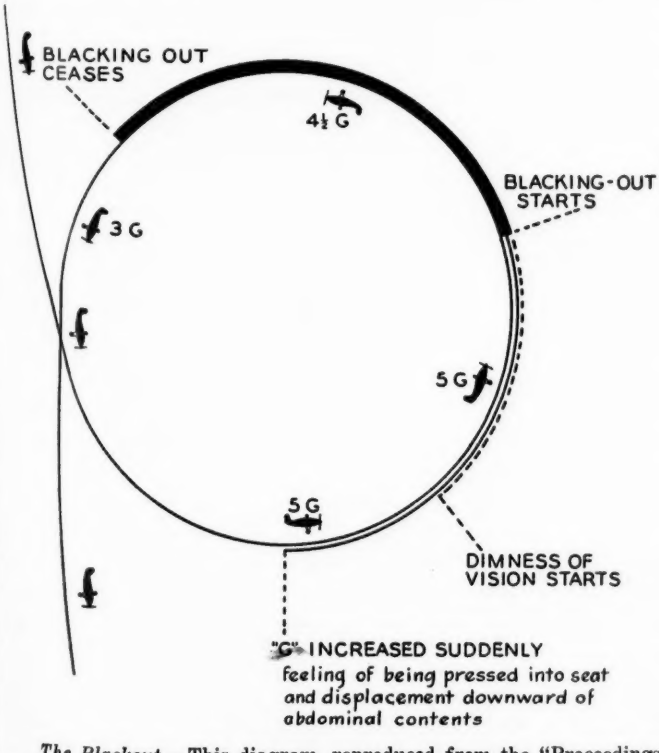
The markedly increased performance of modern aircraft with their increased size, weight, speed maneuverability, rate of climb and "ceiling" has created a situation in which the machine has far exceeded the limits of human endurance. As a result, aviation medicine is now faced with the problem of suggesting new methods and means to overcome the adverse effects of flight on the human body. Extensive work has been done on the effects of decreased atmospheric pressures, the bitter cold of the stratosphere, and of anoxemia, or oxygen want, in altitude flying. One of the most interesting and important problems now facing the flight surgeon is that of devising means of overcoming "blacking out," or sudden blindness due to "centrifugalization," which is often experienced in combat flying when sudden changes in the direction of flight take place. This phenomenon is described in this abstract.—THE EDITOR.

The extremely important and highly interesting phenomenon known as "blacking-out" is described. The condition

was first encountered by aviators during the period of training for the Schneider Trophy race in 1929, at the time when airplanes had developed sufficient speed to produce centrifugal forces greater than 4 "g"* while performing sharp turns. "Blacking-out" is sudden, but it does not occur immediately an excess over 4 "g" is applied. There is a period of delay lasting a variable number of seconds, depending on such factors as the amount of "g" applied, the general physical and vasomotor tone of the person concerned and the anticipation of or unpreparedness for the maneuver performed. The phenomen is neatly demonstrated in a diagram which is reproduced here.

The main effects of high "g" on a healthy man are, first, a feeling of being forcibly pressed into the seat of the airplane, then of the abdominal contents being displaced downwards; this is quickly followed by a gradually increasing dimness of the whole visual field, then sudden blindness or "blacking-out" occurs, but consciousness is retained, except in highly susceptible persons such as those with poor cardiovascular tone. "Blacking-out" passes off as suddenly as it occurs while the loop or turn is being completed at a force less than 4 "g."

The cause of the phenomen seems to be the centrifugal effect on the general blood pressure and on the local blood circulation in the central artery of the retina. Thus complete "blacking-out" of vision occurs until the normal blood pressure is readjusted when the centrifugal force falls below 4 "g." Various preventive measures have been tried, of which the first and obvious one is the maintenance of a high degree of physical fitness. Elastic belts and folding chairs, intended to tighten up abdominal pressure, do not seem to have fulfilled their purpose, while the administration of oxygen does not delay nor prevent the onset of "blacking-out" though carbon dioxide has been shown to raise the limit of endurance to "centrifugalization."



The Blackout.—This diagram, reproduced from the "Proceedings of the Royal Society of Medicine," illustrates how blackout is caused by continuous application of "g."* If the "g" is applied in the opposite direction a phenomen known as "redding-out" occurs caused by the concentration of blood in the head.

*1G represents normal gravity, as expressed in one's weight. The factors 3, 4½ and 5, in the diagram, indicate the extent to which the pull of gravity is increased.

The Cavalry Reconnaissance Detachment of the 46th Division in the Drive Against Blangy on 6 June

["Der Vorstoss auf Blangy durch die Aufklärungsabteilung der 46. Division am 6. Juni," in *Militärwissenschaftliche Rundschau*, January 1941. Translated and condensed from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

On the second day of the attack on the far side of the Somme and to the west of Amiens, when the 46th Division again encounters stubborn hostile resistance in places along the front and is scarcely able to progress, the reconnaissance detachment is ordered to move forward in the neighboring area, occupied by a tank division, to reach the heights to the north of Poix and to reconnoiter in the area toward the river.

The small city of Poix is about 16 miles away. It is traversed by the Poix river, whose crossings are very important to us in our advance. To the north lies a high row of hills, well suited for defense purposes. What would be more likely, therefore, than that the enemy should make a stand in this area? This, then, is really a task for the cavalry. The objective is to the hostile rear and flank.

The advance starts in the following order: First, the cavalry squadron; in the center the motorized portions; and finally, the bicycle squadron. When they arrived in the division area on the right, nothing was to be seen of the tanks. Lifeless the terrain lies before the detachment, hilly and partly covered with woods. In conformity with their own peculiar needs, the tank division had apparently made its way down the highway without concerning itself with the other portions of the detachment. Caution is therefore in order.

After a march of about 12½ miles they take a short rest to the south of Le Fayel. Horses are watered. The point of the column then moves ahead. Scouting patrols, moving on in the lead, report the two towns ahead, Camps and Molliens-Vidame, occupied by the enemy, and prepared to resist our advance. The point of the column turns off the highway; the others follow. (See map on Page 66.)

We pass through grain fields between the two villages. Small hostile detachments appearing in our path are driven off or disarmed and sent to the rear. We have no time for prisoners or lengthy questioning. Saint Aubin, reached after another hour's march, is also occupied by the enemy.

Again we pass around the west side of a village. Travel by map is no longer possible. The point leader gets his bearings from hill to hill.

This time a detour does not succeed so well. At the edge of the village, we hear the rattle of machine guns. However, before the enemy can lay effective fire on us, the

Montagne-Fayel
Camps
Seux
Fluy
Revelles
Thiéulloy
Tricamps
Nampsau-Mont
Moyencourt
Croixault
Lachapelle
Ercheu
Ennemain
Bergicourt
0 ½ 1 2 3 4 5 6 miles

forward-galloping troopers dash into a hollow along with the bicycle squadron, which is lagging somewhat in the rear over the pathless ground, and disappear in the defilading terrain. The bicyclists are having difficulty in pushing their heavily loaded wheels forward and in keeping up with the cavalry. Besides this, they have the noon-day heat to contend with, and the dust, which covers the detachment with a natural camouflage.

To the southwest of Saint Aubin, we come upon parts of the tank division, facing the southwest and engaged in battle. After quick orientation we part again, turning off to the south, this time with the hills to the north of Poix as our objective.

We are not forced to stop and fight in front of Thieulloy. About one hostile platoon in the village had been attacked and driven out in a sudden encounter with a bicycle scouting patrol, assisted by an armored scouting car.

Meanwhile a new order has come by radio from division headquarters: "The army will take possession of the passages across the Poix at Blangy and Famechon by surprise attack." This means a drive across the river beyond Poix.

At the air field north of Poix we become aware that the bicycle squadron is lagging behind more and more, and can no longer keep up the pace. The men, who for the last 10 miles have hurried cross-country pushing their bicycles, are at the end of their strength. To avoid all delay possible, the bicycle squadron is ordered to follow as rapidly as possible, while the cavalry squadron and staff are to hurry through to Blangy.

The town of Croixrault, on the road to Blangy, is reported occupied by the enemy. Again we detour around it. The widely separated platoons trot by the village at a respectful distance. Suddenly we hear the cry: "Half turn to the left! Enemy tanks!"

Six enemy tanks roll out from a bit of woods to the left and bear down on the squadron, all guns ablaze. A few riders drop, as do a few horses. There is the signal to gallop! In a wild dash, the disorganized platoons move across the field, leaving the enemy tanks farther and farther in the rear.

After a hard dash, squadrons and staff rejoin in a hollow northeast of Blangy, entirely separated from the rest of the detachment.

They can ride no farther, since the enemy occupies the bit of woods in front of the village.

After quick decision, the squadron commander attacks the woods with a few units. After brief resistance the enemy throws down his arms. Three heavy machine guns and fifty prisoners are taken. The cavalry scout patrols, which had been ordered to occupy and hold the bridges in the village below, succeed in its surprise attack. The French are driven from the bridge. Hostile forces are now both in front of and to the rear of us.

To clinch our success, the remaining parts of the detachment must now be brought up with us, the bicycle troops and the armored rifle troops. This is possible, however, only by fighting, since the enemy is between both parts of the detachment. The bicycle squadron is ordered to attack the village of Croixrault and to return to the detachment through the village. The detachment adjutant, who was ordered to break his way through to the bicycle troops and to lead them to Blangy, finds the squadrons still at the air field north of Poix. Without hesitation, Croixrault is attacked. But this time immediate success does not materialize. The attacking platoons are permitted to get very close. Then follows severe fire from hostile heavy and light machine guns, dug in on the outskirts of the village. The bicycle troops try repeatedly to overcome the enemy. With heavy weapons they support their advancing comrades without let-up. The platoons remain close to the foremost houses, however. There is no advance. Not until evening did they subdue the enemy with the help of a damaged German tank which rolled into the village and drove the enemy back.

It is dark when the rest of the detachment marches through the burning village of Croixrault to push through to its detachment at Blangy, where the bridgehead can be taken.

The little cavalry coup succeeded. The reconnaissance detachment is in the rear of the enemy. Retreating from the north, the enemy finds the way blocked. Three hundred ten prisoners and numerous artillery and train vehicles are taken.

The Motorized Division

["Motorizovannaya Divizya", by General Emilio Caravelli, Italian Army. (The original article appeared in the Italian military periodical *Esercito.*) Translated and condensed from the Russian, from *Voyenniy Vyestnik*, February 1941, by Lieutenant Joseph Dasher, *ORC.*]

The motorized division is a large unit, equipped with motor vehicles, and capable of covering more than 125 miles a day. It is endowed with various possibilities for maneuver and is employed for both tactical and strategical missions. Being always in readiness for combat, it can be suddenly thrown across the border for action and occupation of the most important objectives in enemy territory.

Strategically, the motorized division may be used for: bold attacks on the enemy flanks and rear; exploitation of success attained by other units, through bold and deep penetration; preventing the enemy from capturing important positions or for relief in defensive action, covering of a weak spot or counterattack.

From the standpoint of organization the motorized division is conveniently divided into smaller units and is so joined together that it may be speedily concentrated near the objective and thrown into combat with the full mass of its firepower.

Thus, the motorized division may be easily concentrated in large masses in the most important sectors, or it may maneuver on the flanks or within intervals.

The motorized division can act jointly with large mechanized units, also with forces transported by motor, and with mobile and infantry units.

When forming a part of a larger force, the motorized division retains its characteristic features and is capable of executing various operative missions—from the strategic reconnaissance to the establishment of contact with the enemy, and from the engagement to the pursuit.

The motorized division consists of: a considerable number of men on motor vehicles for reconnaissance and security missions—they can be organized into a powerful and mobile mass for maneuver; infantry and machine guns on motor

vehicles; light artillery for the support of infantry; antitank and antiaircraft units; engineer unit; flash-ranging unit; chemical warfare unit; radio, telephone and photo-telegraphy units, and those services (excluding motor fuel supply) which attend to liaison and local supply.

In addition to organic elements, additional units, depending on the particular mission, may be assigned to the motorized division for reinforcement, such as: artillery, antiaircraft units and motorized machine-gun units.

The motorized division presents also the following negative characteristics: during movement it is very sensitive to all artificial and natural obstacles; when only one road for vehicles is available, the depth of its column will be very considerable.

The former of these negative characteristics may be removed through prior clearing of the route (removal of obstacles). As to the latter it should be noted that when traveling at high speeds the column can quickly close in towards the head.

The motorized division is very vulnerable to air attack, but this can be avoided through organization of antiaircraft defense for the column, and by protecting it by own aircraft.

Motorized troops require a higher degree of preparation and organization than other types of troops. Both the officer and enlisted personnel must be especially trained in: creating and cultivating of a strong "automotive consciousness"—not only a profound understanding of mechanics, but also devotion to the equipment; development of the necessary moral qualities for action in unexpected situations; ability to organize movement, halts, liaison, close range defense and antiaircraft defense in every situation; careful physical training, in order that the personnel may be capable of sudden efforts of lightning intensity; formation and development in the officer personnel, from the higher commander down to the platoon leader, of strong individual qualities, bold initiative and a love for responsibility.

The Formation of the Bridgehead at Beaugency, 17-18 June, 1940

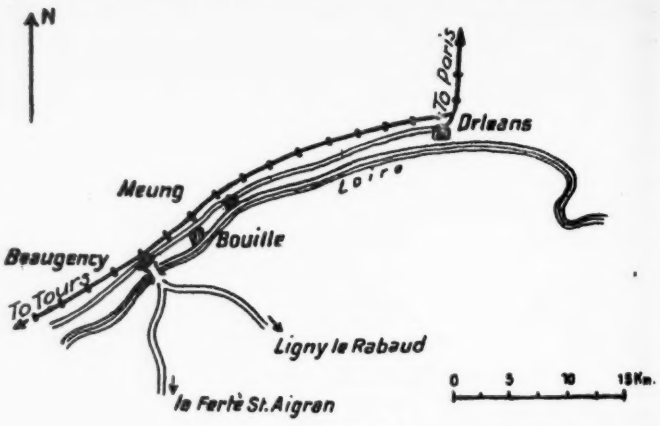
[Die Bildung des Brückenkopfes von Beaugency, 17./18. Juni 1940," by Lieutenant Noak, in *Militärwissenschaftliche Mitteilungen*, April 1941. Translated and condensed from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

Along the great highway from Orleans to Tours, which lies along banks of the Loire, are the village and bridge of Beaugency. (See Sketch 1)

The small villages of Meung and Bouille to the northeast of Beaugency had been captured on the afternoon of 17 June 1940, after heavy local fighting by elements of an advance guard moving down the Loire. My company—— a part of an antitank (Panzerjäger) battalion—belonged to it. At twilight 17 June, we began to settle for the night. It was soon dark, with no moon. For a summer's night, it was noticeably cool.

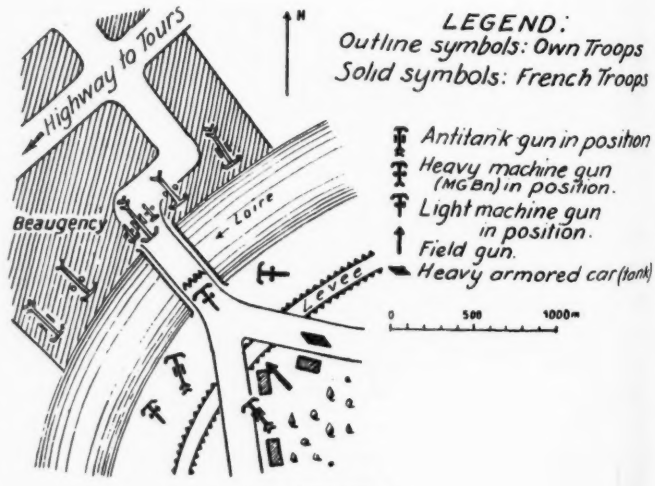
Presently my company commander came and told me that we were going farther. I immediately had my platoon assemble and, during that time, received the following order:

"According to aerial reports, the French have established themselves on the south bank of the Loire at Beaugency to defend the bridge there. The Army commander attaches greatest importance to the immediate seizure of the bridge. With this in view, an assault detachment of pioneers, with your platoon attached, will investigate the condition of the bridge to determine whether it is prepared for demolition. Explosives will be removed. A portion of the advance guard will be sent after you as reserve reinforcement."



SKETCH 1

My platoon had scarcely slept an hour during each of the last few nights. In their drowsiness, they did not understand what it was all about, even when our vehicles were on the way to their new objective, "the north edge of Beaugency." As soon as we arrived there, I established contact with the commander of the bridge assault detachment, who informed me of the situation. A pioneer reconnaissance group just then reported that it was possible to reach the bridge without hindrance, that the bridge was intact but guarded from the opposite bank and besides was prepared for demolition.



SKETCH 2

I quickly had my three antitank guns and the two light machine guns brought forward. With guns ready to fire, we went through the village to the bridge. A number of pioneers were already there, about to cross the bridge and cut the ignition wires fastened to both ends of the rail. We saw them disappear into the darkness. In the meantime, my guns went into position on the right bank of the Loire, one

aimed directly across the bridge, the other two to the right and left of the bridge. (See Sketch 2.)

Suddenly we heard the clatter of a heavy tank on the opposite shore, some 450 meters away. Then several machine guns began firing. Mixed with it all were shouts and piercing cries. You could see nothing. But now commotion was heard on the bridge. Our guns were ready to fire. Our pioneers came rushing back, out of breath and nearly all wounded. They shouted: "Tanks and machine guns on the bridge!"

Fire from the opposite bank of the river meanwhile steadily increased. From time to time, we could still hear the rattling of the tanks. Another company of the machine-gun battalion happened to reach the village just at this moment. It took up positions to the right and left of the bridge to support my few antitank guns.

We had reached the undamaged bridge over the broad stream. It was still intact. We had cut part of the detonating wires of the explosive charges but appeared to be facing a strong hostile force which had the bridge covered with guns from positions on the south bank, had tanks at its disposal and apparently was still able to blow up the south end of the bridge. It was a dark night, which hindered reconnaissance. Our mission demanded immediate action. Time was pressing. It was impossible for us to cross the river without some means of transportation. Only a lucky attack could put the bridge into our possession before the Frenchmen could blow it up. We must risk it.

I took the best commander from my antitank platoon and two machine guns from the machine-gun battalion, whose crews had volunteered their services. I explained briefly what I planned to do. Then we started. The antitank gun, aimed toward the front, was pushed slowly and cautiously onto the bridge. The two machine guns were set up in positions along the bridge rails. We had advanced but a few meters when we were caught in the heavy fire of a machine gun, which must have been directly in front of us. We dropped flat as we could on the bridge floor. The bullets screamed past us, ricocheted off the rails. Near the river banks these rails were made of concrete and of iron for a distance of about 150 meters in the center of the bridge. At various angles, bullets bounced off the shield of the antitank gun.

After recovering from our first surprise, we tried to locate the machine-gun position. It could be only on the bridge. We determined its direction by the muzzle flashes, but, in the darkness, could not estimate the range. All we could do was to fire and see where our shots hit. So we fired several rounds of explosive shells apparently with good effect —but the machine gun continued to fire. At every shot, our antitank gun had a terrific recoil on the asphalt floor of the bridge, and it was difficult to hold it in place while we were in prone position. Gradually, we advanced on the bridge. The two machine guns resumed providing security for us, with bullets passing close to our heads.

After we had crawled an additional 100 meters farther, dragging the gun along with great effort, we brought up two machine guns and reopened fire. Due to darkness, the powder smoke and the awful roar, we could neither see nor hear.

The French machine gun continued to fire. Besides, we were now under fire, through the iron railing in the center of the bridge, from several machine guns set up in flanking positions. Suddenly, both our machine guns ceased firing at almost the same moment. The machine-gun section leader came crawling toward me and shouted that both guns were overheated; also, that the cannon ammunition, of which we had brought along a limited supply, had been used up.

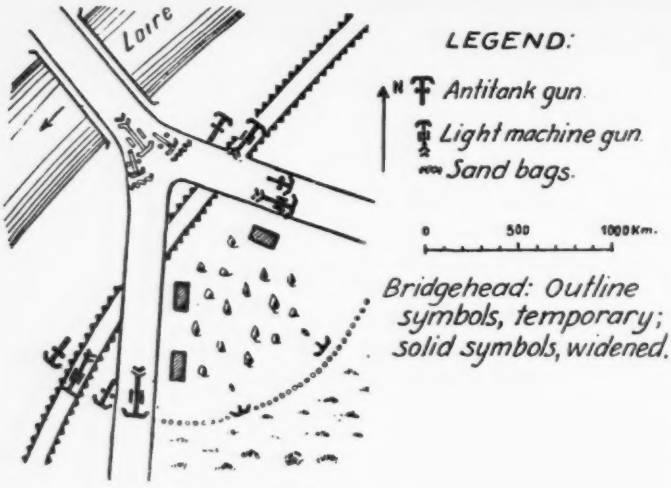
Several men crawled back for more. In order that the Frenchmen should not notice too much the awkward pause in our machine-gun firing, we fired with pistols and rifles. Soon, however, both antitank gun and machine guns were again ready and, once more, we made another hitch of a few meters forward. There was a loud noise and suddenly the enemy in front of us ceased firing. We had arrived at about the last third of the bridge. Everything was dark in front of us, but a few meters ahead, we could make out something across the roadway. We were getting hand grenades ready when, suddenly, something darted toward us at great speed. A shot rang out from the antitank cannon, and again all was quiet.

It was now absolutely necessary for us to know what was in front of us. We were strangely upset. In spite of the cold, our coats were wet with perspiration. We lay flat on the floor of the bridge, ready for the assault. The antitank gun was loaded, the machine guns were ready to fire. All men held hand grenades. In order to see, I shot a white flare and the enemy started to fire again, but the machine gun in front of us remained silent. In the flare light, we saw a dead horse, back of it a road barricade made of sand bags and on the bridge railing an explosive charge.

When all was dark again, we unfastened the explosive charge and threw it into the water. Then we threw our hand grenades behind the barricade. We removed the barricade under cover of our machine-gun fire and were about to push our antitank gun farther ahead when there was machine-gun fire from in front. We saw then that the French had changed their position. We could understand how the machine gun had held out so long—back of the sand bag barricade. We replied with high explosive projectiles. In the heat of the fight, the machine-gun battalion platoons, charged with our security, sprayed the opposite bank heavily with machine-gun bullets like a great display of fireworks.

The machine gun in front of us soon ceased firing, and we pushed on. There were but a few intermittent bursts of fire from our left and right fronts. When we reached the end of the bridge, we immediately established a temporary bridgehead (See Sketch 3). A few antitank guns and machine guns were brought up and strongly placed behind sand bag barricades. It was still quite dark. In front of us, at a fork in the road, were several houses with heavy woods back of them. The intervening terrain was cleared by few reconnaissance troops. As dawn was breaking, we began a short but intense fight. With hand grenades and machine pistols, although there were but a few of us, we subdued the remnants of a decimated battalion which had been concealed in the woods. This netted us some 250 prisoners, several machine guns, two antitank guns, about 20 motorcycles with side cars and one field artillery piece. The latter was directly at the end of the bridge (Sketch 2) and at the fork of the road, behind a pile of sand bags. Apparently it had not gone into action due to the heavy fire from our antitank gun.

At daylight, the bridgehead was extended (Sketch 3). During the forenoon, we were relieved by the infantry which had followed us.



SKETCH 3

When I again assembled my platoon, all men were in their places, safe and sound.

The next day, we learned that the Loire bridge, which we had captured, was the only one which had fallen intact into our hands over a distance of about 37 miles in this vicinity. It was used by several divisions. In addition to facilitating a rapid advance for our troops, it made it possible to bring in many prisoners and a great deal of valuable booty of all kinds.

Infantry—A Commentary

By COLONEL BRUNS, of the German Army.

[Translated from *Ejercito*, April 1941, at the Command and General Staff School, Fort Leavenworth, Kansas.]

There exists, in a fundamental way, both the desire and necessity that the Infantry be able, with its own resources, to work out its problems in an independent manner, whether they be problems of attack or of defense. There does exist a simple solution which is to provide the infantry with all necessary arms to bring any attack to a successful end by its own resources without having to fall back on the help of any other fighting branch.

But there are limitations to this idea. The infantry must be, and continue to be, infantry. That is to say, it must be equipped with infantry arms alone. It is much more essential that its proper armament be endowed with a sufficiency of ammunition, than that its armament be increased. The armament which could be added to it is of special types, requiring specialists to service them and which demand or require special instruction. And right here, in the matter of instruction, there exists a limitation. Providing the infantry with arms of a character foreign to those peculiar to it, leads to difficulties and even to disastrous results. Instruction in the use of these special arms leads also to a break in the continuity and diversification of the general course of instruction which is neither advisable nor in all cases within the limits of possibility.

Just what are these limits, and what can and should be added to an infantry company or a battalion? To render a good decision relative to this question, it is necessary to bear in mind the following: "The leader of the troop, that is to say, the commanding officer of the company on the one hand, or of the battalion on the other hand, should concentrate his vision and thoughts solely in the direction of the enemy, and should only be thinking of and seeking means for leading his troop successfully against the enemy, for carrying out successfully the proposed mission, which, accurately stated, consists of annihilation of the enemy." This signifies, that if weapons are given to him which will of necessity have to remain in the rear, he will find himself forced to remove a part of his attention from the infantry which is advancing in the fulfillment of a difficult mission. In other words, his attention will be distracted too frequently toward the rear, that is, toward the weapons which he has in the rear, and which are dependent on him and his orders. Also, the selection of a location for the command post must be carefully considered. It should not be too far removed from the heavy guns, yet as far advanced as possible.

We operated in the Polish Campaign with infantry companies each supplied with two heavy machine guns and two heavy trench mortars. This plan did not, however, by any means, prove its efficiency. When these arms occupied rearward positions the situation described above existed. With a view to avoiding this, we tried to advance the positions of the machine guns to the line of the attacking infantry, leaving the heavy mortars behind. But in this case their peculiarities were not properly taken advantage of, for considering the devastating fire of automatic arms, it is not possible to employ heavy machine guns in open positions without paying a high tribute of casualties. Consequently, we employed the heavy machine guns in the same manner as light ones. But they were not made for this and are employed to better advantage in other positions. The experiences of the Polish Campaign proved definitely that rifle companies should abandon the use of heavy machine guns and mortars; increasing, on the other hand, the number of light machine guns, from nine to twelve. The heavy trench mortar passes, as an heirloom, to the battalion.

Now, since it is impossible for infantry to execute a successful offensive with its own resources, that is, without outside help, it is permitted to obtain this help from its allied arms, and in the most rapid and reliable manner. For this reason it is now provided with adequate means of communication besides being given a detached observer from the divisional artillery units, who accompanies the company charged with the principal mission.

Let us consider, first, these means of communication. Each battalion can be equipped with two telephone lines and two radio stations, and this results from the fact that in the deployment of the German battalion—consisting of three companies of rifle troops and one of machine-gun troops—only two companies of rifle troops are engaged, and with the above mentioned means of communication, there always exists a sufficient security for the maintenance of good communication with the two companies deployed in the front lines, even in combat. The machine-gun company has independent means for establishing its own communications network. The commander of the said company always remains close to the battalion command post, as there is constant communication with him. By means of the aforementioned battalion communication system, the advanced companies are able to communicate rapidly and dependably with the battalion headquarters. Consequently, the battalion will be able, by the use of its own weapons, to act in accordance with

the desires or necessities of its companies. The battalion possesses, as its own weapons, twelve heavy machine guns and a heavy mortar unit of six guns, in addition to the machine-gun company. Also, a part of the infantry gun company and a part of the artillery, working in close coordination, are added to the battalion. When the battalion is fighting at the point of greatest resistance, it is supported by greater forces of infantry guns and artillery than when an attack is made against less strongly defended points. With the means which it has at its disposal in such cases: A machine-gun company, a mortar unit, a part of the infantry gun company and certain parts of the artillery, the battalion commander is able to solve whatever problems present themselves to his companies. The command of this special instrument, constituted of a variety of arms, is an art which the said commander will be obliged to learn during the course of his period of service; and it will be necessary for him to attain to perfection in the difficult task by dint of hard effort —as in all things. But this can only be accomplished by sufficient technical experience and adequate education. For this reason, when seeking commanders for battalions, it is best to choose young officers, training them in classes in which they are mainly taught the operations of the combination instrument constituted by the ensemble of the above mentioned arms. He who cannot learn this, will never be able to guide and command a battalion safely.

Let us return to the support of an attack by weapons which do not belong specifically to the infantry. In the German Army it is fundamental that no infantry attack is to be carried out without artillery support. The division has at its disposal three groups of light howitzers of 105-mm (nine batteries), and one group of medium howitzers of 150-mm (three batteries). The division generally makes this artillery up into three groupings. Two of them are assigned the mission of coordinating with the infantry, occupying themselves with the combat of those objectives which oppose themselves to the attainment of the missions assigned to the latter. The proportion of light to heavy artillery which enters into the said groupings, is determined by the particular tactical situation. With the rest of the artillery left over, another grouping is formed with the mission of holding down the enemy artillery. One essential matter, which must not be lost sight of, is that the pivotal point of the artillery action coincides with that of the infantry attack.

In this type of combat, it is plain to see how close the collaboration is between the German infantry and artillery. Taking care of the perfect functioning of this coordination was one of the lessons learned from the World War, and is practiced, conformably with these teachings, throughout all sections of the army during exercises and practice war maneuvers. The results obtained are excellent. As we have already indicated, artillery observers accompany the infantry at all important points of attack, and these maintain a direct contact with their batteries by means of the radio sets with which they are provided. These observers are located close to the commander of the infantry company fighting at the main point of attack. The said commander is therefore able to signal to the detached observer the objectives which he cannot subdue or eliminate by his own means. In his turn, the latter, making use of his radio apparatus, directs or guides the fire of his battery to the point of terrain indicated to him. As can be seen, no closer coordination could be imagined between the two branches, and it has led to the greatest success in the Polish as well as in the French Campaign.

What is the procedure followed in actual practice? The battalion, which has the mission of attacking a decisive point, adopts a plan of attack in which two companies are stationed in the advanced lines, one of them to take care of the said main point of attack, establish contact with the enemy's outposts and attempt to repulse them with its own resources. If the enemy resistance becomes so intense that his own resources are insufficient for obtaining success, then the company commander communicates this fact by radio or telephone to the battalion commander, who then makes use of his weapons of reinforcement—his heavy machine guns, trench mortars and infantry cannon. At the same time, the commander of the company communicates to the detached artillery observer, in the same manner as to the battalion commander, the objectives which he has to attain. As regards the distribution of fire of the heavy weapons of the battalion and coordinating infantry, it must be seen to that the target, or its most essential points, are covered with as heavy a fire as possible. This method of cooperation has proven itself very efficacious.

In case the desired results are not obtained by collaboration of the special weapons of the battalion, then the commander of the same will transmit his requests to the regimental commander with whom he is in contact. The commander of the regiment will, in the first place, be able to assist him by making use of his reserves, or, at least, their heavy weapons; or else, can retransmit to the divisional command the request that it directs the fire of its three artillery groups on the main objective which is impeding the progress of the battalion. It is also possible to fall back on the help of tanks, in case the division has these at its disposal. We see, therefore, as we mentioned before, that the correct functioning or operation of the "instrument" requires the employment of the proper weapons at the proper time and against the correct objective, all of which presupposes long experience and apprenticeship in these matters.

We must still call attention to the fact that it is not so easy to employ the battalion's communication system. In case the advance is being made in open order, it would be wrong to employ telephone communication. In this case a radio platoon is detailed to each battalion and each of its companies, which establishes direct contact, during pauses in the advance, with the various stations concerned. As soon as the deployed advance goes over into attack operations, it is correct, and even necessary, to establish telephone communication. Advance in deployed formation as well as attacks themselves, must never be made without the protection of heavy weapons. For this purpose, the battalion will employ a part of its machine-gun company, and the division a part of its artillery, that is to say, the third group which we mentioned before. The artillery assigned to the mission of security for the infantry, must not be handicapped by the necessity for keeping watch of the progress of the deployment. On the contrary, it must be already in position when the change is made from advance to attack. For this purpose, it is necessary that the said artillery be situated in the most advanced positions at the very time the attack is made, as far as this is possible, and this with the object of avoiding premature changes of position in the direction of the

attack. "The artillery must fire and not march." With what I have explained, I have tried to show how the German army has managed to fulfill the requirements of the points advocated by the author of the article, INFANTRY, and this not by an increase in the number of special weapons with the infantry, but by means of an intimate cooperation and union of the same with all the allied and auxiliary branches of the service, which open and smooth its road to success.

Rifle Fire Against Aircraft

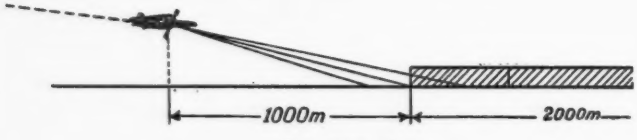
["Ruzheyniy ogon' po samolyotam," by Captain V. Lebedev. Translated and condensed from the Russian, from *Voyenniy Vyestnik*, February 1941, by Lieutenant Joseph Dasher, *ORC*.]

The employment of aviation against land troops was introduced during the first World War. Heppner describes the battle of the Somme thus: "* * * enemy aircraft, flying at the lowest altitudes, fired machine guns upon our infantry in trenches and shell holes, and upon our artillery positions."

During 1914-1918 aviation was active against land troops both in daytime and at night. The German author, Captain Pfeiffer, wrote as follows: "* * * it is not without interest to recall the work of the British and French fliers in Flanders, who attacked our troops at night and fired at every vehicle in the rear."

Recent experiences in Poland, Norway, Belgium and France show that an important part in the German victory over the Allied forces was played by the air force. Units, poorly protected against air attacks and poorly trained in counteraction against them, were easily disorganized by fighters and dive aircraft. Conversely, the war experience in Spain has served to prove that, with antiaircraft fire system well organized, any air attack from an altitude of 500 to 600 yards was virtually impossible.

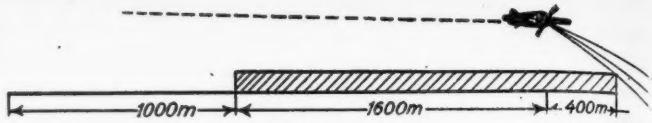
How effective may be an air attack against land troops? As an example let us take the case of an air attack on units in marching formation and compare the strength of the attacking aircraft and the antiaircraft potentialities of an infantry battalion with its own means of fire.



SKETCH 1

Fighter aircraft begin firing before the target is reached. This is done for the purpose of causing confusion and panic in the ranks of forces proceeding in marching order, and in order to disrupt any antiaircraft security measures. To achieve this fighter aircraft begin firing from a distance of about 1,000 yards from the column. See Sketch 1.

The depth of the column of a reinforced battalion is estimated at two kilometers. The plane will cease firing before passing the target; therefore, it is possible to fire above the target for the duration of 10 seconds at the plane's speed of about 310 to 340 miles per hour. See Sketch 2.



SKETCH 2

A battalion proceeding in marching order, after having been warned by its security elements of an impending air raid, will not have more than one minute in which to disperse and to prepare the means for repelling the attack. Within this time the personnel will be able to disperse to a distance of 200 yards on both sides of the road. Thus the area subjected to fire will increase to $2{,}000 \times 200 \times 2 = 80{,}000$ square yards. An element of fighter planes can fire 3,000 to 4,500 rounds, which will offer a small area for effective hits (one round to each 180 to 260 square yards).

In addition to this, the effectiveness of the attacker's fire will diminish due to the difficulty of reaching the targets, difficulty of firing because of the low altitude (the flier must watch the ground), etc.

In order to increase the effectiveness of hits on targets, attacks by fighter planes will recur, and the effect of such attacks on enemy troops will be strengthened by dropping of a large number of small bombs.

Let us look into counter-measures of land forces against the aerial enemy.

Our (Soviet) field manuals indicate that an aerial target may be effectively hit by rifle fire at altitudes of up to 500 yards. In order to increase the effectiveness of the system of machine-gun fire, there should be a special detail of not less than three rifle squads. By taking into account the necessity of organizing fire of high consistency, so that the enemy would be fired upon by not less than two squads simultaneously, such squads should be placed at intervals not greater than 200 yards.

Two squads (20 to 25 riflemen) during 6 to 7 seconds—the length of time during which the aircraft are within the zone of rifle fire—can fire up to 40 rounds, with the proper training. Even though the effectiveness of fire against such fast-moving targets as airplanes is low, nevertheless with the proper training and perseverance of the riflemen some good hits may be expected.

In this connection, the views of the Germans on the employment of rifle fire are of interest. The Germans regard that accurate rifle and machine-gun fire, if sufficiently heavy, can be a real menace to the aerial attacker. For securing effective results the simultaneous firing by 15 to 20 soldiers is necessary. Numerous experiments have shown that in such a case rifle fire creates the same effect as machine-gun fire.

Our (Soviet) field service regulations note that low-flying attacking aircraft are successfully combatted by rifle fire. Hence, rifle fire should be employed in every situation when this weapon is free from the tasks of land fighting, i.e., on the march, at a halt, etc.

The necessity of organizing rifle fire is also dictated by the circumstance that in modern combat it will be necessary to repel attacks of a large number of aircraft by machine-gun fire alone, which, due to the quantity of targets, will not be sufficient.

As a rule, grouped rifle fire should be concentrated against aircraft. The only exceptions are snipers, who may fire individually. Small units will open fire at own initiative, at the platoon leader's command and without waiting for instructions from a higher commander.

While on the march rifles should be loaded and locked with the safety catch. This promotes the readiness to fire.

Artillery Liaison Detail with a Tank Battalion

(FIELD ARTILLERY MAP PROBLEM)

[This is a digest of an article which appeared in the March, 1941, *Artilleristische Rundschau*, the Field Artillery Journal of the German army.]

The 5th Tank Division reached its objective on the evening of 10 May. On the early morning of 11 May, it intends to attack the enemy, in position along the general line Zgl (two kilometers southeast of Plate)—Luesse—Muehl-B, and advance via Luesse—Lage—Retz—Grabow—Jesern to operate against the hostile flank and rear. (See map.) The enemy artillery positions are to be the first attack objective. The attack, scheduled to begin at daylight, is to be executed by tanks and infantry. The divisional organization for this attack is indicated on the attached sketch. The 116th Artillery Regiment has been ordered to support the tank attack with the mass of its batteries, and to support the infantry attack with at least three batteries.

General Situation.

On 10 May, enemy reconnaissance planes were driven off by our pursuit planes and we also gained air superiority.

Troops—two-thirds regulars and one-third reserves, all with war experience.

Ammunition—Full supply received during the night.

Fuel—Filled up to 80% during the night.

Communication—Postal lines are destroyed.

Weather—Clear.

Sunrise—4:18 AM.

Sunset—7:47 PM.

The 2d Battalion, 116th Artillery Regiment (P.C., firing positions, and observation posts are shown on the sketch. Batteries are designated as 4th, 5th, and 6th Batteries) will cooperate with the 31st Tank Regiment.

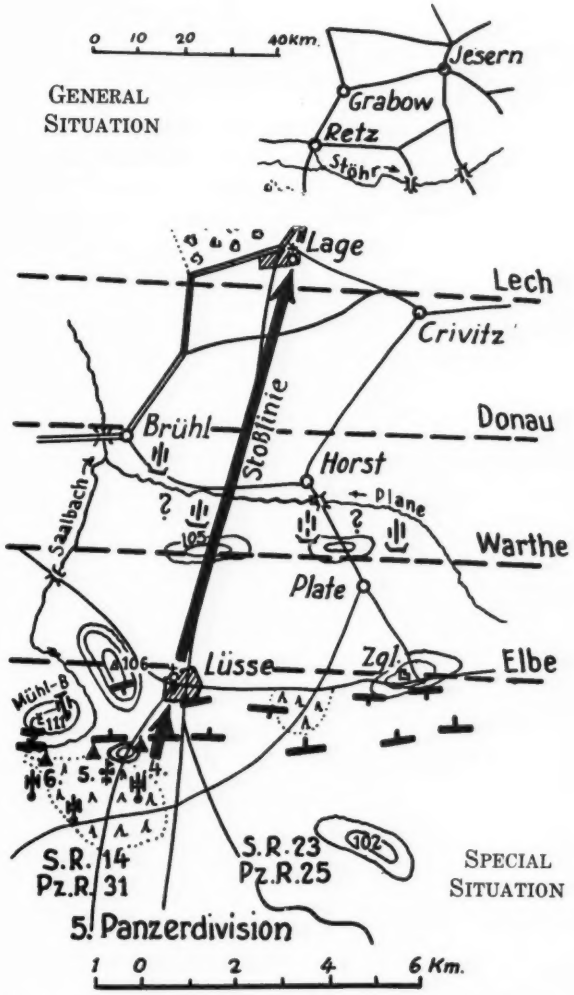
Immediately after receipt of the attack order, which will furnish the organizational basis for cooperation in combat, the commanders of the 31st Tank Regiment and of the 2d Battalion, 116th Artillery Regiment, will confer and discuss in detail the artillery support for the attack based on reconnaissances of the previous evening.

The leader of the artillery liaison staff of the 2d Battalion, 116th Artillery Regiment, who was present at the conference, will report to the commander of the 1st Battalion, 31st Tank Regiment, as this battalion will be the first unit of this regiment to attack.

The artillery liaison officer will inform the tank battalion commander concerning the organization of the observation posts of the battalion and batteries, and the possibilities for effective fire support; after the designation of artillery targets in the zone of attack has been coordinated with those of the tanks, the artillery liaison officer will inform the tank battalion commander regarding the concentration of fire on those targets which already have been located by reconnaissance.

The liaison officer in his conference with the tank battalion commander stated: The 4th Battery accompanies the 1st Tank Company; 5th Battery the 3d Tank Company; 6th Battery the 2d Tank Company.

The battery commanders will leave their observation posts and accompany the attack in armored observation cars when the tanks commence to advance. The battery commanders have been given orders to direct their fire at hostile defensive weapons during the course of the attack, especially in the tankproof area between Muehl-B and Hill 106. (When the attack begins the 2d Battalion, 116th Artillery Regiment, and if necessary, also the heavy artillery battalion, will fire a smoke screen at suspected enemy observation posts.)



The tank battalion commander has the artillery liaison officer briefly repeat the tank objectives and routes thereto as well as the boundaries of the tank zone of attack, in order to prevent any misunderstanding. Then he requests the artillery liaison officer to inform his battalion commander that when the tanks are advancing past the tankproof area southwest of Hill 106, it is important that concentrated artillery fire be directed against the southwestern

edge of Luesse where hostile defensive weapons are suspected to be in position. He again draws attention to the fact that due to the nature of the terrain, the narrow zone of attack must be traversed by the tanks as quickly as possible.

The artillery liaison officer replies that concentrated artillery fire is possible from the present gun positions and that he will immediately inform his battalion commander regarding the wishes of the tank battalion commander.

It might be stated here that, before the attack commences, the wishes of the tank battalion commander with whom the artillery battalion cooperates directly, will be transmitted personally by the artillery liaison officer to his battalion commander, if time permits. If time does not permit, this message is transmitted by motorcycle messenger. Transmission of the message by radio is forbidden.

When the infantry and tanks begin the attack on 11 May, the artillery liaison officer rides in his tank in close proximity to the tank battalion commander.

The attack proceeds as scheduled. The enemy observation posts on Muehl-B are neutralized by the well-placed smoke screen. The artillery disabled two antitank guns which were located close together between Muehl-B and Hill 106.

The artillery fire is now being directed against the edge of Luesse, presumably under direction of the battery commanders in their armored observation cars.

At this moment the tank battalion commander observed additional enemy antitank guns in the tank-proof area east of Muehl-B, which had previously remained unobserved because of their good concealment. He recognizes the danger of their fire to the flanks of his tanks advancing toward Luesse.

There is no time to turn around and, furthermore, a tank attack in that swampy terrain would be impossible. Artillery alone can render assistance. The tank battalion commander gets in radio communication with the artillery liaison officer, already listening in on the tank battalion net, and requests the artillery fire at the hostile weapons on his left flank.

The artillery liaison officer, who rode over the terrain with open eyes, had also recognized the danger threatening the tank attack. He had already reported the new targets to his battalion by radio.

The artillery battalion answered as follows: "At present very poor communication with the batteries. You get in communication with the battery commanders and transmit the new targets to them!"

This order had just been received when the tanks requested artillery support. The artillery liaison officer recognized the observation car of the commander of the 6th Battery as it drove into a depression. Now he can see that he has stopped his car and is on a knoll not far away. The liaison officer drove up to him in his tank. As the knoll furnishes cover, he jumps out of his tank and informs the battery commander regarding the new targets. Shortly thereafter, he also succeeds in informing the other battery commanders by radio of the targets on the left flank. When our tanks have proceeeded beyond Luesse and there is no longer any danger threatening from the edge of this village, the fire of the batteries is soon directed at the enemy antitank guns on the left flank.

In a short time the artillery succeeded in silencing the hostile guns on the left flank. Muehl-B and Hill 106 are evacuated by the enemy and the advance toward the hostile artillery positions beyond Luesse is continued by our tanks.

Although the importance of the artillery liaison detail was demonstrated in this instance, the necessity thereof is still more pronounced later in the attack. By remaining in constant communication with the artillery commander, the artillery liaison party is kept informed of all changes in position which the batteries make or plan to make.

A change in position is usually only undertaken after the tanks, supported by their own artillery, have penetrated into the area of the enemy battery positions. A premature change of position would leave the tanks without artillery support just as the penetration takes place. Artillery which is supporting tanks must make the maximum use of its range once it has gone into position behind the front. If a change of position becomes necessary, the artillery liaison officer will be informed as to the area of the new positions as well as the length of time that will be required before the batteries are again ready to fire.

Such a change of position is of great importance to the tank battalion commander. He must insist that the change of position does not take place when his tanks are assembling. Coordination between the two weapons is only possible if the tank battalion commander is advised in advance by the artillery liaison staff of the necessity for moving batteries forward because they lack range. He can then, with the aid of the map and with his knowledge of the terrain and the progress of the battle, make preparations for the assembly of his tanks under the protection of the artillery when it is again ready to fire. On the other hand the artillery liaison officer informs the artilley battalion commander regarding the intention of the tank battalion commander to assemble his tanks, in order that artillery protection will be available at the designated time. The artillery liaison officer may temporarily represent the tank battalion commander in conferences with the artillery battalion commander. Even if the artillery battalion commander is made mobile and follows the attack, it is not his mission to remain constantly in close proximity to the tank battalion commander. It is his mission during the engagement to place his batteries in such position that they will be able to support the tanks by concentrated fire on especially threatening targets.

The artillery battalion commander must himself give the orders designating the new areas for artillery positions which at times, in consideration of the total situation, will not coincide with the opinion of the battery commander who has only a limited sector before him. Very often it is necessary for the battalion commander personally to designate definite targets.

From the above it is obvious that the artillery battalion commander cannot drive in close proximity to the tank battalion commander. He should not be tied down to one place, but must be free to move about. When batteries are moved forward, he must decide the approximate new positions, allot targets, and seek to aid the tanks by concentration of fire.

The artillery liaison officer will provide for direct exchange of opinion between tank unit and artillery commanders with the view of assuring the necessary artillery support.

The situation will often permit a conversation between the tank battalion commander and the artillery liaison officer through the open tank doors during which the latter will learn of the plans of the tank unit commander and in turn can explain the support that the artillery battalion will be able to render. Such conversations, which should be sought frequently, are possible if the artillery liaison officer remains close to the tank unit commander. The more capable the artillery liaison officer is in artillery matters, the more often the tank unit commander will consult him when making decisions. It is wrong for the artillery liaison officer to reply as follows to every demand: "Yes, my battalion can do that." If it then develops during the engagement that too much was promised, or that the artillery was not technically in a position to meet the demands, mutual confidence is shaken. However, confidence in the advice of the artillery liaison officer constitutes the basis for success. If the tank unit commander knows that promised support will be rendered on time, he will also take the artillery officer's "No" when demands cannot be fulfilled. He realizes that the artilleryman knows his weapon and that in the case in question artillery support cannot be counted upon. The tank leader will take the artillery situation into consideration when making his decisions and he will then be assured of the entire strength of the artillery support.

German Armored Troops

[Condensed from an article in *The Tank* (Great Britian), May 1941.]

The German Armored Corps was from the first a *corps d'élite*, with specially selected personnel, carefully trained, and with a full and lavish equipment in vehicles, arms, spare parts, and maintenance and repair facilities. Not all the first ideas that had been evolved from the original theoretical studies of the immediate post-Great War years stood the test of the practical experience to which the Germans were fortunately able to subject them before the outbreak of the present conflict. The unopposed advances into Austria and Czechoslovakia showed up many technical defects in the vehicles and the insufficiency of the maintenance and repair systems. The war in Spain made manifest the limitations of the light tank model then in use—a model which was at once scrapped and replaced by an improved one. In Spain, too, was tried out, practiced and perfected the close cooperation of tanks and aircraft, which has proved so potent an offensive weapon today. Thus when the second Great War broke out in 1939 the German Army had in its Armored Corps a most powerful arm, unequalled by anything possessed by any other belligerent—strong, of high technical and tactical standards, war-experienced, and master of a new technique which combined all the advantages of surprise, mobility and fighting power.

Nevertheless, brilliantly as the corps acquitted itself in Poland, defects revealed themselves, which the Army Command found it necessary to rectify before the next and more severe test of the campaign in France nine months later. Only four armored divisions seem to have been used in Poland, though probably one or two more, also in existence, were trained on the Western Front, and it was decided to double this strength by the spring of 1940. It was found, too, that the armor of the lighter models was too thin to be proof against the Polish antitank weapons, and this, too, had to be remedied during the ensuing winter. It goes without saying that the lessons of the Polish campaign were carefully studied and the methods of operations modified accordingly where found necessary, and that reserves of trained personnel, vehicles and stocks of spare parts and fuel were augmented. The new armored divisions were formed by mechanizing the existing S. S. formations, picked troops of high standard and spirit. The enlarged and perfected Armored Corps was thus able to play in the Low Countries and France as vigorous and decisive a rôle as the year before in Poland. In Libya and the Balkans this same corps, by then raised to a strength of fifteen divisions—not all, probably, employed on these two fronts—once more acted as spearhead to the German attack.

Each panzer division is now a self-contained formation of all arms, organized and trained for swift and vigorous offensive action. It comprises about 400 tanks of all types, organized in two battalion brigades; in addition it has a three-battalion brigade of motorized infantry, a mechanized field artillery brigade, and special battalions of engineers with bridging equipment, of heavy machine guns and of antitank guns. A mechanized reconnaissance detachment of motorcyclist machine-gunners precedes its advance, operating swiftly on a wide front. Behind it is a complete ordnance recovery and repair organization to supplement the work of the light air detachment forming part of each of the four tank battalions. The division has also its permanently allotted supporting air squadron in constant wireless link with it. The division as a whole is thus a most mobile and powerful weapon, and is capable, as indeed often happened in France, of breaking up at need into a number of yet smaller self-contained units each consisting perhaps of a tank troop, with a section of antitank guns and an allotment of armored cars and motorcylists, operating separately with a special task and objective.

Generally speaking, the tendency now in the German Armored Corps seems to be to reduce the number of tanks in the division, so as to be able to multiply the total number of divisions, and to increase the weight, armament and armor of machines. The light tank is being gradually replaced by the medium, and the medium in turn by the heavy, or cruiser type, possibly with a super heavy model in reserve for special tasks. So far there is no evidence that the Germans actually used the 75 or 100-ton giants with which rumor credited them in France last year; nothing as heavy as 40 tons was identified there, though something bigger may be in use now. Technically the German tanks in France proved inferior to our own, but this inferiority may now, of course, be remedied. It was numbers that enabled them to prevail there, and this advantage they have up to the present been able to maintain.

The Tank Battle Near Le Vivier Danger

[Das Panzergefecht bei Le Vivier Danger," by Lieutenant v. Hobe, in *Militärwissenchaftliche Mitteilungen*, May 1941. Translated and condensed from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

The 4th Battery of a horse artillery regiment which was acting as reinforcement for a cavalry regiment, on the morning of 9 June 1940 broke camp in the neighborhood of Marseille le Petit about 47 miles north of Paris, and resumed its advance to the south. (See sketch) The battery was travelling at the head of the cavalry detachment, to protect the latter from tank attacks. In advance of the battery were but a few reconnaissance patrols and a few antitank guns. During previous days the enemy had frequently attempted to hold up our rapid advance by tank attacks.

We had been making good progress and by 11:00 AM had travelled some 9½ miles, when we came to the low country which marks the course of the Avelon creek and sighted the railway line connecting the towns of La Chapelle aux Pots and Le Vivier Danger. South of the river we could see a main highway. Both railroad and highway followed a course at right angles to the highway which we had been following. Our road led around curves and between high hedges down to the Avelon creek, well concealed, then gradually rose on the other side to the main highway.

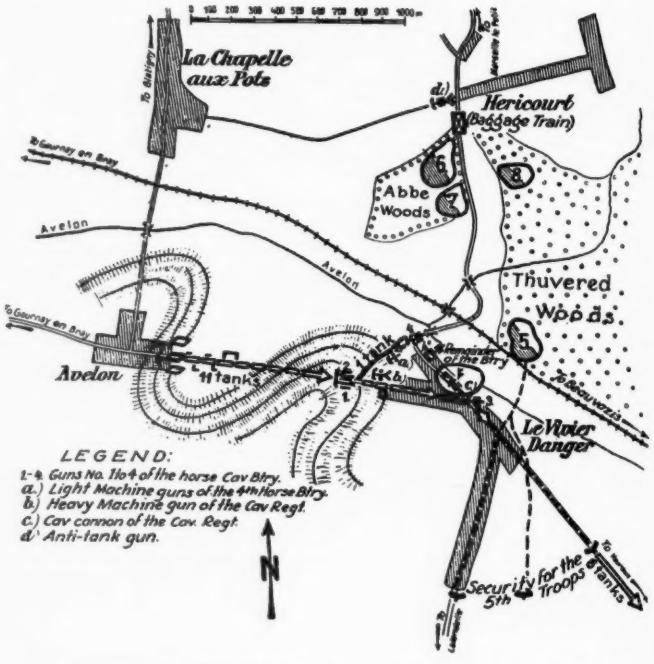
Just as the battery was preparing to move forward, the battery commander, Lieutenant von Rosenberg-Lipinsky, ordered Lieutenant von Hobe to lead the battery forward as far as possible at a trot, to Latandelle, about 3¾ miles south of the railway. The terrain had been reported as free of the enemy up to this point. The battery commander then returned on his motorcycle and rejoined the commander of the cavalry detachment, near the head of the column.

The battery had just started on a trot, when a runner came hurrying back from one of the advanced antitank guns, and pointing to a group of trees about 1,500 yards to the the southwest, reported: "There are enemy tanks in the park area next to the village of Avelon." Since unsuitable terrain made it impossible to use antitank guns at the moment, the battery continued immediately on its way and arrived at the railway tracks. Lieutenant v.Rosenberg halted the battery there and confirmed the report that there were, in fact, three enemy tanks, half concealed by the trees, along the highway near Avelon.

Curtly and clearly he ordered: "All tank ammunition to the front! First Platoon moves to the fork in the highway near the west side of Le Vivier Danger, with the first ammunition wagon, which is to unload! Third cannon to the fork in the highway 400 meters south of here to protect the open flank! The fourth gun goes into position next to the Avelon bridge, to protect the rest of the battery, directing its fire toward the main highway. The rest of the battery will seek shelter at once in the (Thuvered) woods 200 meters to the rear!" However, the rest did not have the time to reach this shelter, and took cover in a brick yard near the position of the fourth cannon.

Lieutenant von Rosenberg then went forward to the fork in the highway where Lieutenant von Hobe had practically got the guns of the First Platoon into position, one on the right and one on the left of the highway. Fire was at once opened up on halted tanks 700 meters away.

There was no movement in the tanks or in the surrounding terrain until the third shot. This resulted in a direct hit on a hostile tank and caused smoke and flames to interfere with visibility. At this moment a yellow cloth, apparently the attack signal, was waved from a tank turret and suddenly, to our astonishment, one tank after the other emerged from gardens and yards onto the highway. Finally about eleven tanks were bearing down onto our two guns with wide open throttles, following their leader. The enemy opened fire at the same time with machine guns and small cannon. Shots whistled over our heads. Some struck against our armored shields and fell to the ground.


La Chapelle aux Pots
Hericourt (Baggage Train)
Abbe Woods
Avelon
Thuvered Woods
Remainder of the Btry
Le Vivier Danger
11 tanks
LEGEND:
1-4. Guns No. 1 to 4 of the horse Cav Btry.
a.) Light Machine guns of the 4th Horse Btry.
b.) Heavy Machine gun of the Cav Regt.
c.) Cav cannon of the Cav. Regt.
d.) Anti-tank gun.
N

We all realized what we were up against. Either we should ward off the tanks, or else they would drive into the detachment of the cavalry regiment. We did our best. All worked together in exemplary fashion, assisting one another mutually in observation, gun-laying, carrying up and preparing the ammunition. Each applied himself to the task at hand. Nevertheless one favorable feature of the terrain was against us and cost the life of many a brave gunner. The highway ran through a depression which shut off our view of the approaching tanks over a stretch of 400 meters. When these had once disappeared into it, they did not reappear until within 100 meters of our guns. (See sketch.)

An enemy tank was soon hit, but unfortunately dust and powder smoke hindered visibility. We could see that it had stopped in the center of the highway, apparently incapable of further action or movement; but that the other tanks were passing around it. Soon another tank was forced to cease firing because of a direct hit in its turret, but was able to proceed.

The men kept firing, cool and collectedly from behind the gun shields, but in spite of it the tanks came roaring on closer. Another tank was put out of commission right in front of our platoon. The remainder of them were now so close to us that the bullets from the machine guns were be-

ginning to penetrate our gun shields, several of our men were wounded and the second cannon had no more ammunition.

Some of the gun crews now sought shelter in the deep highway ditch. Others tried to reach the limbers by bounds and by crawling along the ditch. In the meantime, the fate of our comrades was sealed. French tanks overran our guns.

The tanks were now laying down their fire on the highway on which some of the cannoneers were trying to reach the fourth cannon. One was hit fatally, others were wounded more or less seriously.

Soon one of the tanks turned into the highway leading off to the northeast and bore down on the fourth cannon, firing heavily. It apparently had the mission of finding out if there would be further opposition in store for it and the other tanks if they suddenly were to turn northward and head for the cavalry regiment detachment behind us. In fact, if our fourth cannon had not blocked the enemy's path at this point and the crew had not fired shell upon shell at him nothing would have prevented the French from doing a great deal of harm to our cavalry and horses.

In this manner, this reconnaissance attempt was broken up, and the tank forced to retreat. In this fight, however, the fourth gun was put out of commission and most of its crew wounded.

When the rest of the enemy tanks had again assembled at the fork in the highway, they attempted a breakthrough to the southeast in order to rejoin their columns. In so doing, they were obliged to pass our last gun, the third cannon, which was located around a bend of the highway further to the east, for security in that direction. In spite of the short range, the speed and violent fire of the tanks, the third cannon put the first of the tanks out of commission with a few direct hits. But there were too many opponents. Shells and machine-gun bullets penetrated the gun shield at this short range as well as passed through the gun-tube loopholes and sighting embrasures. The entire crew and the commanding officer of this lone gun were severely wounded. In his haste, the enemy did not take time to wreck this gun. Hence, this third cannon was the only one to escape.

The engagement cost the lives of four and eighteen were wounded. The valiant battery had destroyed five enemy tanks and prevented their reaching the columns of troops behind them. The comradeship in arms between cavalry and artillery grew even stronger after that. Advanced details of the staff, also, and of the 5th Squadron of the cavalry detachment had attempted to drive off the steel giants with their machine guns and cavalry weapons. They, too, suffered casualties.

But the battery showed, on 9 June 1940, that the horse artillery, true to tradition, is also capable of meeting all demands of modern warfare.

The Battle of Crete

["La bataille de Crete," in *Revue Militaire Suisse*, June 1941. Translated from the French and condensed at the Command and General Staff School, Fort Leavenworth, Kansas.]

The battle of Crete constitutes without doubt one of the most interesting military operations of this war. Indeed, it has put on neither the character nor the amplitude of the actions which have been unfolded during the past year on the western front; but it brings out new operations that will become more and more prominent as time goes by.

The fate of this island has been decided in a land battle strongly supported by aviation.

In this theater of operations the naval forces of Great Britain reveled in a superiority as incontestable as did the Axis in aviation.

This is one of the first battles where the naval forces, left to their own resources, were clearly worsted in their battle with hostile aviation.

One has indeed proof of this fact, that a fleet can no longer claim the mastery of the sea without the aid of aviation.

There have been precedents, but the example of Crete is typified by the fullness of the operation. From the day when the English communique announced that the British aerial forces were retiring from Crete, the fate of that island was sealed.

The possibilities of parachutists and air-borne infantry were brought out to the fullest extent.

The campaign in Norway and that in Holland had shown that Germany possessed troops well trained in those two specialties. They had shown that such operations could be performed but they were not on so large a scale as in Crete.

Germany, in Norway and Holland, had limited her action to the capture of airdromes and some other objectives in order to facilitate the progress of the other troops.

In Greece, even, the parachutists were dropped at the far side of the Isthmus of Corinth, in order to obtain a bridgehead on the Peloponnesos, their object being nothing more than to permit the approach of the armored forces.

In Crete, however, parachutists and air-borne infantry conducted practically all the battle. This is what made it novel.

The battle of Crete began 20 May. It was preceded by aerial bombardment which lasted around two weeks, interrupted by a systematic aerial exploration which permitted photographing the principal objectives in every detail. The attack proper was preceded by the occupation of islands in the Aegean Sea to use as bases.

The mechanics of the attack were those already known to us in previous operations.

At first, the bombardment aviation composed of a large proportion of "Stukas" attacked the British aviation on the ground and the antiaircraft defense of the airdromes themselves. This operation was conducted in a very rapid manner and, as always, by very dense waves. Scarcely was this action ended when the transport planes arrived protected at a high altitude by pursuit squadrons, assuring the mastery of the air.

At the beginning the attack was localized in three places on the north coast; in the environs of Suda Bay, which served as a base for the English Fleet, near Rethymnon, and in the neighborhood of Candia.

The first assault wave seems to have been formed, not only by parachutists, but also by air-borne infantry in transport planes or in gliders towed by them.

The first parachutists occupied the places, designated on the air photos, before their departure and they covered the arrival of those following, supplied with various kinds

of matériel and light cannon. Next came the engineers charged with quickly clearing a landing field for the giant transport planes.

* * *

At the time of the capture of Fort Eben-Emael by the Germans, one sees the participation of gliders in this operation. Since that moment one had heard no more about that kind of aviation. We only know that the Germans built a great number of gliders and paid much attention to the study of gliding.

The idea of transporting troops in gliders seems to have been entered into by the Germans after much practice in that line. It solves several difficulties.

The landing of troops destined to seize airdromes, or other objectives, constitutes always a delicate phase which uses up much materiel. (One can read about this with much interest in the German account of the operations in Norway and Holland. At the time of the landings in Athens, the Germans relate that the aviators found one place strewn with obstacles.)

In place of using an expensive materiel, one often difficult of retrieving, because of the losses in materiel, the Germans prefer to employ towed gliders. If the machine suffers damage in landing, the loss is small and, better, the difficulties of finding good landing fields do not exist so much since a glider can be landed almost anywhere.

The capacity of these planes appears to be around eight to twelve men. Thus, if our information is correct, a Junker 52 and three gliders transport nearly a section of infantry with its armament and materiel.

If certain dispatches can be believed, hydroplane gliders have been employed with equal success.

Transportation by gliders seems to present some advantages over the landing by parachutists. First, the instruction of the troops transported is not so complicated as is that of the parachutists; second, the men are grouped upon landing. There is not that deadly time, exceedingly dangerous, just before the parachutists regroup themselves.

* * *

The New Zealand, English and Greek troops inflicted heavy losses in men and matériel on the invader. But the Germans were constantly reinforced by the air route, by parachutists, air-borne infantry, cannon and small tanks.

The German aviation unreservedly sustained the ground troops. Aviation officers joined the ground troops in order to coordinate with them the objective common both to the aviation and the ground troops.

These attacks by parachutists always happened in several places at the same time, in order to force the defender to disperse his reserves.

Such an aerial invasion demands combatant troops of the highest quality. The necessity of having good terrain diminishes greatly with the employment of gliders, the great proportion of a country becomes vulnerable to this kind of an enterprise.

* * *

The German air force attacked unceasingly the British Fleet operating against the troop convoys. In spite of the losses borne, the British Fleet was able to fulfill its mission as long as it had aviation support. However, on 24 May, the Germans, making use of small Greek ships, succeeded in reinforcing by sea the troops already landed from the air.

The British and the Greeks put up a stubborn resistance at Candia, Rethymnon and Canea.

These towns were then strongly bombarded by German aviation which caused great damage. Spreading out in all directions from the air field at Canea, the assailants succeeded constantly in bettering and extending their positions as far as the northwest coast of the island. From 24 May, this group tried to make contact with the others operating in the east.

On 28 May, leaving the Dodecanese Islands, infantry and naval troops of Italy debarked on Crete. On 29 May, the defenders of Candia capitulated.

On 30 May, the Canea group made contact with the group in Candia. The British troops fell back to the southern shore, followed by the German forces.

On 1 June the Germans and the Italians joined one another at Hierapetra, on the south of the island, taking 12,000 prisoners, while the English succeeded in re-embarking only 15,000 men, which they sent on their way to Egypt.

Some centers of resistance were still carrying on in the interior of the island, but on 2 June the Axis powers announced the end of the operations after its total occupation.

According to information from English sources as late as 30 May, 30,000 Germans had participated in the battle of Crete, using 1,200 transport planes and 500 gliders.

* * *

In England the sharp criticisms raised against the government after this new defeat complicated considerably the defense of Egypt. It was reproached for not having utilized the seven months of occupation in order seriously to organize the defense of Crete. In reply, on 10 June, the Prime Minister was only able to state that the lack of materiel did not permit such an undertaking of the defense of Crete as he would have wished.

There were tasks more urgent and more important.

The battle of Crete has produced a profound impression throughout the world, not so much because of the value of this geographic objective, but because, as we said at the beginning, it was truly the first great aerial landing on hostile shores.

More than once we have stated that the defense of a country is no longer an attack of the enemy frontier, but it has become enlarged in scope, the interior of a country being as exposed as the frontier areas.

* * *

Editorial Comment.—The French newspaper *Le Journal*, in an article giving the role of parachute troops and air-borne infantry in the attack on Crete, among other things states the following which gives additional data and is therefore included:

"The last wave of bombers had hardly left its base when the transport squadrons took off, protected at high altitudes by Messerschmitts. The bombers returned, the smoke and dust of explosives still hovering in the air when the parachutists were released by the "Junkers" whose somewhat reduced speed decreased the effort to be made by the men. However, the latter reached the ground at an average speed of 25 kilometers per hour. This meant that the physical training of the specialists was severely tested. Each Junker transported the effectives of a squad and the gliders which they hauled carried the complement of men and matériel which together formed a platoon ready for combat.

"The first parachutists, commanded by the squad leader immediately occupied points which had been the subject of careful selection on the map. They protected the landing of the rest of the platoon arriving with machine guns and light cannon. Sections of engineers landed. Their mission was to clear the spots chosen for the landing of the heavy transport planes. The combat engaged by the first elements rapidly increased in intensity and its firepower was further developed by the arrival of new platoons. As soon as a sufficiently large space had been occupied and distant protection was insured, the "Junkers 52" returned transporting the air infantry. Platoon after platoon, company after company, the battalions went into action. Other planes continued to unload materiel and supplies of all kinds. The Stukas made up for the absence of heavy and medium artillery which airplanes could not transport; they bombed the enemy lines disrupting the immediate rear areas and paralyzing the movement of reinforcements. . . .

"Extreme flexibility, the art of landing on the ground and very rapid reactions limit the number of fractures and sprains to the rate of two per cent of the parachutists released. . . ."

Motorized Infantry Company Attacks Calais

[From the article, "Our Company Storms Calais," by Sergeant Hermann Schulze, German Army, in *Militär-Wochenblatt*, 7 March, 1941. Translated and condensed at the Command and General Staff School, Fort Leavenworth, Kansas.]

The following features of this article will prove of particular interest to the reader:

(1) Pioneers, with their special equipment, were brought forward by the Germans to attack the strong Allied position near the bridge.

(2) The Allies' obstacles were too weak to be of real utility. Obstacles ought to serve to gain time, and if they are easily punctured they have no substantial value. The Germans use tanks against them for quick results. To counter this, obstacles and their approaches should be carefully mined.

(3) At one point heavy armored assault artillery was employed.

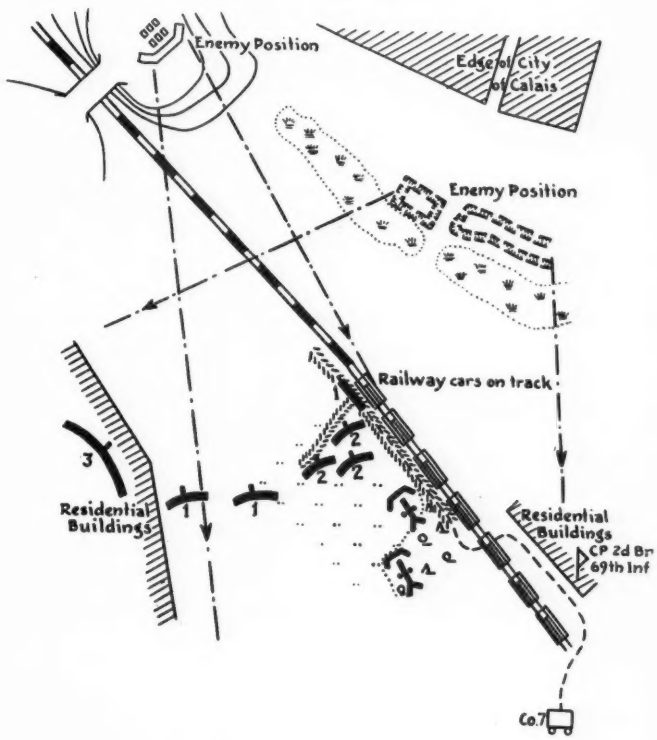
(4) Note should be taken of the method of issuing oral orders; also of the available weapons, the way they were used and when.—*The Editor.*

The company had been fortifying Cuines, a town six kilometers this side of Calais, since midnight. Houses, deserted and overturned from cellar to attic, showed that French or British troops had previously been billeted here. They had evacuated the locality with great speed, however.

Our outposts made a careful reconnaissance in the morning. Nothing was either to be seen or heard of the enemy; not even English observation planes entered our territory.

During the morning our security detachments were withdrawn, and shortly afterward the advance toward Calais was continued. The road led beside a narrow canal past bridges closed off with primitive barricades of motor vehicles and beams. We soon met the first refugees who had fled from Calais; heavily laden they passed us in terror pushing hand-carts and baby carriages.

The motor vehicles halted. Shots were heard; the enemy was apparently not very far distant. Antitank guns flew past us; we waited. Tanks rattled to the front; we waited! The first tanks soon came back. "First aid! First aid!" We suddenly saw that a tank had been attacked; our severely wounded comrade was carefully lifted out. Pont de Coulogne, a suburb of Calais, was occupied by strong forces.



"Platoon Commanders, 7th Company, to the front!" We hurried across the railroad tracks to battalion headquarters. We came to a street that could be seen by the enemy; a couple of bullets whistled by and we had reached headquarters. "The company is to go into action at once!" said the company commander. "2d Platoon to the right of the tracks; 1st Platoon to the left of the tracks; machine-gun unit behind the 1st Platoon; behind that the 3d Platoon awaiting further orders from me." Meanwhile, a runner had been sent to the company to lead the way. The advance then took place slowly. The platoons had to prepare under cover because the enemy was directing heavy fire on the company. To the right of us, the 6th Company was apparently in action for several trucks carrying personnel were hastily taking cover. The men crept and bounded in file across the tracks to a ditch. The advance was then smoother because the enemy had apparently lost sight of us. The men followed one another in close formation. Suddenly the 2d Platoon joined our ranks also. At the beginning of its advance it had reached open terrain and had been fired upon so severely by the enemy that further advance had become

impossible. Thus the 2d Platoon had been unable to enter its own zone of action on the right of the tracks and was forced to advance in the 1st Platoon zone of action on the left of the tracks. We then lay in complete disorder. Lieut. W. attempted to dislodge his platoon as quickly as possible. The cover became scarcer; in fact, we were soon uncovered and suddenly heavy rifle and machine-gun fire poured in upon us.

"Machine-gun units forward!" It was only a distance of a few yards to the front, but in spite of that it took quite a period of time because the enemy fire was well directed. Finally both guns took their position. Where was the enemy? He was still firing, but gun and unit leaders could not see him. At our right, on the railroad tracks, stood freight cars; every minute new holes appeared in their walls. Obliquely striking shells hummed over our heads. We decided that enemy forces lay beyond the tracks and were firing under the freight cars. Among the whines of the rifle bullets could be heard a sound that was sharper; one that had never been heard before. Finally, through our glasses, we spotted a well hidden group of the enemy. About one kilometer distant he lay on the bridge behind cover which might have been a bunker. (See Sketch.) It was too far away to be seen clearly. Even before the machine gun could get into position properly, parts of the instruments crashed around the ears of the gunner, noncommissioned officers and men. It was impossible for the gun to remain there. Noncommissioned Officer H. fired from the very beginning as a light machine gunner. That, however, is not the purpose of a machine-gun unit, so we were forced to withdraw. We reached our starting point grumbling considerably. We must be able to pass by this opponent! From a new and much more favorable position, we fired round after round into the enemy, but it didn't weaken him; he replied immediately with machine-gun fire, which seemed incessant. It was necessary to employ the trench mortar unit against such a tough opponent, and this unit appeared just at the right moment.

Meanwhile the reserve platoon had also been sent up for action. Under cover of the gardens, it worked its way to the houses at the left. This unit took the first prisoners. A rifleman saw steel helmets glittering inside a shack. A hand grenade in front of the shack, a round of machine-gun shells inside and then about 15 Frenchmen came out. Then the platoon—some of which was inside the house—directed its fire on the enemy positions across the tracks.

Couldn't the whole attack be ruined against this bridge? A pioneer unit was sent up. They worked their way up the elevation under cover of our heavy machine guns and trench mortars.

"Company, attack! Company, attack!" sounded the voice of the company commander. Then the advance went smoothly, and when the key position fell in our hands, the enemy resistance was broken. We turned to the right, across the railroad tracks. Only single shots were heard, and then more than a company of earth-brown soldiers ran toward us with upstretched arms. The French prisoners were marched into captivity. But our road led farther, we reached the enemy positions. The casualties lying around were proof that troops of the neighboring detachments had assisted in our success.

We reached Calais. The battalion commander approached us. His orders were curt. We took the positions from which the enemy had offered us such stubborn resistance. Then we discovered the cause of the peculiar sharp sound of the shells—British antitank guns and their excellent cover: six large oil barrels.

Six heavy machine guns provided our security before Calais.

A quiet night was behind us. The outposts were on guard. There—there, wasn't that movement behind us? Even through the glass nothing could be seen exactly. Yes! There were rifles. It appeared to be a whole battalion, deploying and developing in its approach to our position. Then we saw more clearly—they where German troops. Apparently they wanted to take our elevated position once more. We sent white signals into the air. We were there! A short time later the 86th Infantry Regiment marched past us.

Meanwhile, the company combed through additional streets. The platoons advanced cautiously to within a short distance of the city hall, and then farther advance seemed impossible for a deadly rain of fire descended upon the company from three directions. The personnel took one bound into the houses, parks and behind the motionless motor vehicles to protect themselves. Some jumped into the city hall. To their amazement the place was full—about 2,000 civilians were using it for shelter. At 8:50 AM the German war pennant was flying from the city hall tower of Calais! The new section of the town was already in our hands. Across the canal, in the old section of town, the enemy still offered stubborn resistance. Now and then bullets whistled through the streets. The enemy sent two tanks across the canal to obtain information about our advance and, after being greeted by our antitank guns, immediately withdrew.

The platoons lay under cover around the city hall. The machine-gun unit also arrived during the course of the morning and disappeared in the Alhambra Movie House. Suddenly, a tremendous explosion was heard in the street followed by a second, and then everybody took cover. The next struck the movie house and a section of the cover collapsed. White as chalks, the machine gunners dashed out, with and without helmets, with and without packs. After the first shock, everyone became quiet again very quickly; one man was slightly injured, the packs were collected and then the position was changed to one in St. Pierre Park across the street from the city hall. Near us a heavy infantry gun on caterpillar tractors came up and finished off several nests with direct fire.

"Platoon leaders to the Company Commander!" "The citadel and old town have been prepared by the enemy for defense. Artillery will fire on the city for one hour, then the 7th will attack. The point is to cross the bridge immediately behind the city hall as soon as possible. Following that the old town is to be thoroughly combed out."

Meanwhile, the artillery had commenced; we lay waiting in the park. The heavy shells hummed over our heads. But what was that? A hit in our neighborhood? A second one! We decided that our artillery was firing too short. Now what? White signals were sent up. The artillery continued its firing undisturbed. In spite of everything we approached. One bound and we crossed the street into the movie house and then into the city hall. That was accomplished. As some of the first ones started to go out again they

were met by deadly fire. Lieut. V. tried vainly to advance; a fatal bullet robbed the 2d Platoon of its leader. The attack was stopped at the city hall, the machine gunners selected suitable window places and opened fire; additional advance was out of the question for the time being. The artillery took up its fire again and set several houses on fire. Meanwhile, we searched the whole house for suitable positions. In the tower there were many observers who waved us away whenever a machine gunner tried to take up position nearby.

On the evening of this black day, the battalion commander came to us in the city hall to explain to us—his subordinates—the whole plan of attack. He mentioned the great importance of our mission in strong and humorous words, and thereby inspired us, and with us the whole company, which had always proved true in previous engagements but seemed to have been followed by misfortune all that day.

Meantime, it had become dark. Guards were posted, a reconnaissance unit was sent out to obtain information. But even the enemy was quiet. Movement could be seen in the glare of the burning houses, a number of light tanks were driven close together to form a second line of barricade for us; the first was set up on the bridge.

"Artillery will fire on the city. From 9 until 10 o'clock dive bombers are to bomb the citadel while, at the same time, the company is to attack assisted by tanks, after the bridge is covered by a smoke screen. The following is the order for the platoons: 1st Platoon, machine-gun group, 2d and 3d Platoons." Those were the words of the order next morning. The artillery had already begun its music. The shells whistled and hummed over the city hall. The dive bombers swooped down and bombs whined into the citadel. Our time had arrived. The 1st Platoon left the city hall, crossed the lawn and with a bound was across the street. The machine-gun unit followed. Then the enemy noticed our activity and his defense fires continued without a break. The 1st Platoon was able to advance only very slowly. The machine-gun unit tried unsuccessfully to take position somewhere, to provide a protective barrage. The 2d Platoon could not take up a position near the 1st Platoon because then they would be too closely concentrated, so they stayed on the lawn. The 3d Platoon for the same reason was unable even to leave the city hall. The heavy machine guns had taken no position at all. Corporal H., who fired from the only possible position, as the only light machine gunner, was fired upon at once with increased intensity. If the machine guns were to be effective at all they had to withdraw; they were best able to assist the company from within the city hall which provided the best position for observation. The men jumped back singly. A corner room was soon found upstairs in the city hall which overlooked the entire length of the main street and even provided a glimpse of the canal. That was the right place for us. In the middle of the room an emplacement was made of tables and boxes; the gun was made ready for firing, but what had become of the enemy? Shots could be heard coming from three directions, but no enemy could be seen. We looked around feverishly. Sweat stood out on my forehead.

Finally we commenced firing from the tower. An enemy had been discovered. A sheaf of fire whistled through the window of a house across the way, a few yards above the heads of the 1st Platoon. One of us found a British antitank gun and opened fire with that. Four men watched all directions, three held the carriage firmly; Corporal M., who acted as an observer, and I sat at the gun. "Front, middle, rear" appeared the objectives on the street to be immediately taken under fire. "There, by the wall among the vines, are what look like officers examining a map!" announced an observer. Our gun could not reach that far, but near us was the infantry howitzer observation post. The report was transmitted rapidly, and a few moments later Corporal H. had his howitzer do a little talking; a direct hit finished everything. Our company was still prevented from advancing, the men lay for hours waiting. Strong defense fire was being placed on the bridge. Meanwhile, it had become afternoon. The battalion commander made a new decision. The 1st Platoon was ordered to return at once to the city hall. The 3d Platoon, which had been waiting there until then, was loaded into motorized personnel carriers and dashed across the bridge. They took position under cover of a house and began to comb through the houses and streets.

It was essential for the machine-gun unit to move out as soon as possible better to serve in another position. In great haste we ran across the bridge. In front of the barricade in the Rue de Bruxelles we met parts of the 3d Platoon. The 2d and 1st Platoons, somewhat later, came over in trucks and began to comb the streets. A British tank barricade was removed with the assistance of a tank. An antiaircraft gun went along with us and rendered invaluable services together with the tanks and antitank guns. Shells continued to whistle through the streets and wounded or killed our comrades. Frenchmen approached us singly, with upstretched arms, followed by larger units, companies, which came from underground hiding places and cellars. In places where there was still resistance the persuasion of hand grenades was used. The tank drove through the streets and forced the enemy before it. The British appeared and were marched off to prison camps. There were several companies of them among the last.

A path led through a cross street; the street was full of smoke; tears soon appeared in our eyes. Was the enemy using gas as a last resort? We soon found the cause for that, however. Whole streets, which we passed then for the first time, were in flames; heat and smoke rushed toward us; going through was impossible.

Calais was in our hands. A severe battle had ended. The necessary safety precaution measures were rapidly taken. A bomb-proof cellar in the Boulevard des Allies was used for quarters and the men finally received their well deserved rest.

Artillery Helps Itself

[Condensed from an article in *Artilleristiche Rundschau*, November 1940.]

War teaches that an emergency always brings difficulties not fully anticipated in peace-time training. Sooner or later there appear in each unit men who can master the difficulties. Before these men have been found, there is a period of great danger. Success of the surprise element and achievement of the blitz victory leading to complete annihilation of

the enemy demand that all units function without friction on all missions from the very start.

This means that artillery should never lose control with the more mobile weapons and, of course, should never become an obstacle. Since artillery is dependent upon itself and must help itself, it must get into action by overcoming all obstacles as quickly as possible.

Our battery belonged to a tank division. The first obstacle we encountered in Poland was sand. Although matters went fairly well during daylight, tank attacks commenced in the evening and we had to use illuminating fires in order to follow along. One morning when we looked at the map to see what progress had been made during the night, we found that we had advanced only seven kilometers, although we hadn't had a moment's rest.

We soon discovered a method of getting along over the sandy paths, which were interrupted at some places by swamps and demolished bridges. At all times we had two or three men, including battery officers, out ahead to reconnoiter on foot the best route, which frequently led off the regular path, over fields, and through meadows. After finding the best route, these men guided the foremost vehicle forward with a flashlight.

Often we preferred halting to continuing the march into the unknown. Halting involved no loss of time, since the ammunition train, which moved only with great difficulty, could be brought up each time we stopped. The wheels of the train's last vehicles dug deepest. When the going became extraordinarily bad, we knocked down wooden fences along the way and built makeshift stakewalks over the ruts. The last men across loaded the material onto their vehicles in order to have it at hand where there were no fences along the way.

The maneuverability of a motorized unit in difficult terrain is greatly increased if each vehicle carries with it boards or something of a similar nature. There is room for them on every vehicle.

It is not often fully realized that entrenching tools and other equipment are extensively available to a battery from army equipment, signal equipment, and motor transport equipment. If noncommissioned officers and men are trained, for example, the sides of a ditch encountered on a detour can be levelled down and the bottom filled in so quickly that very little time is lost.

We soon learned to bring up to the front the reserve tractors which are normally at the rear of the column. If we came to a difficult place and a motor truck got stuck, the tractor took position alongside the road on the far edge of the difficult stretch, and with its towing line it pulled one vehicle after the other across the obstacle. Then the tractor resumed its position at the front of the column.

At times critically narrow bridges or dangerous curves were marked on both sides with flashlights so placed that chauffeurs were not blinded.

Sometimes swamps were encountered and our fences were of no avail. We halted, cut down a few trees, sawed them into pieces of about twice the width of the vehicles, filled the swamp with the branches, and put the trunks of the trees on top. Thus we provided a stakeroad that held out long enough for the whole battery to cross. Spots that became weak as the vehicles rolled over them were reinforced.

We did not sleep during the first night in Poland, but we learned that our battery was the only one of the battalion which brought up all of its vehicles. To do this, each man had to be able to work on his own initiative under uniform leadership, and each individual had to know where to find a spade, an axe, a hatchet, or a saw.

The following are approximate figures on what equipment a battery has for pioneer purposes: 70 spades, 25 clawhatchets, 6 axes, 4 saws of various types, a large number of towing lines and cables from 2.5 to 7.5 meters in length, a few wire cutters, 25 meters of cable, a wood hammer, and a sledge. Each piece of artillery was given a rake for use on sandy trails.

On the eighth day of the war when we reached the Vistula south of Warsaw, the bridge had been demolished and troops forming the bridgehead had crossed the river on inflated rubber rafts and ferries. Advance observers of all batteries were with them, and they directed fire practically alone during subsequent days because the main OPs furnished little opportunity for observing operations on the eastern bank of the wide Vistula lowlands. Artillery liaison commands assisted to a small extent in directing the fire. Streams are not an obstacle for men with equipment but without vehicles. This fact must be remembered by all advance observers, signalmen, and couriers.

Wooden rafts are uneconomical. Building material must be as light as possible and water displacement as great as possible. We took inner tubes, pumped them up tight, made a square out of four, six, or nine of them, and tied a deck securely over them. Time was gained, of course, when we could locate a deck ready to be installed, as, for example, the fences. Boards or poles may be used, but a considerable amount of rope is required for each raft, since no nails may be used for this work. In a pinch, two tires will carry a man with equipment; three will carry him easily.

We made similar rafts of issue canisters, but these offered several disadvantages. Eight canisters are necessary to carry a man; construction is more difficult and requires more time, and since the draught is greater, the danger of damage to the raft is greater.

A raft made of a tarpaulin filled with some light material such as straw, reeds, or simply brush was of quite a different nature. The four corners of the tarpaulin were tied together after it had been stuffed with this material. A raft made of the tarpaulin of a standard Diesel tractor and filled with brush carried two men, and despite several small holes in the tarpaulin, it functioned for nearly an hour. If straw or reeds are used, the durability is greater, but the carrying capacity gradually becomes smaller.

If cable is at hand, the raft can be drawn back and forth across the stream and the ferryman can be eliminated.

If the advance observer does not have the necessary equipment in his vehicle, a house or village may afford barrels, tubs, and other useful things.

In the same way that a body of water cannot represent an obstacle, lack of natural observation posts cannot preclude observation. There are trees and chimneys. A certain amount of drill will be necessary for overcoming the tendency to ponder over what should be taken along to the lofty seat and in what order of priority. First of all, a line tied to the belt will provide the means of hauling up everything else that is needed. A safety belt and one of the various types of climbing irons should be available.

It is not difficult to be a first class gunner under normal conditions on the maneuver field. It is much more difficult—and above all is much more important—to give weapons the opportunity to be at the right place at the right time. The energy of the leaders, the cleverness of all personnel in all situations, and the proper training of the battery will afford this opportunity.

Operations of the "Greater Germany" Infantry Regiment South of Amiens, June 1940

[From an article by Wolf Durian, in *Die Woche*, 26 February, 1941.]

Editorial Note.—The following elements in this account are worthy of special note.

(1) The German procedure in attacking villages and cities is well set forth. The German units advance around them and take possession of dominating terrain. Smoke, artillery, fire or air bombardment—or any combination thereof—neutralizes the hostile fire while the encirclement is being carried out. After the encirclement has been made the actual attack upon the village begins. It would seem more important, therefore, for the defenders to secure the dominating terrain than to concentrate too much on fortifying the village itself.

(2) Alterations in the position of units in the combat situation generally were reported at once to the appropriate authorities.

(3) During the battle the regimental commander personally observes the vital phases of the section.

(4) The regimental command post was shifted often during the action, though occasionally the change was a very short distance and made for the purpose of avoiding artillery fire.

The advance of the battalions through Amiens was difficult. The streets were congested with division supply vehicles. Every 25 yards, hands went up, signaling: "Halt". Battalion commanders were at the head of their units.

The regimental staff, at the head of the regiment, consisted of the regimental commander, his adjutant, an assistant adjutant, a sergeant, seven motorcycle messengers, and a radio station. Presently, a message was sent to the point by motorcycle, stating that the regimental staff was at the southern exit of St. Fuscien. Actually, at this time the entire regimental staff, the colonel included, were sitting in the road-side ditch at the village exit. St. Fuscien was very uncomfortable due to the activity of the French artillery.

A motorcycle messenger, arriving from the north, jumped from his vehicle into the ditch and stated: "The division command post is at the northern exit of the village." A second motorcyclist, arriving from the south, handed the regimental adjutant the following message: "Battalion Garski (3d Battalion) has arrived in the draw at the southern exit. It is exposed to heavy artillery fire. Have sheltered the vehicles in the nearby woods."

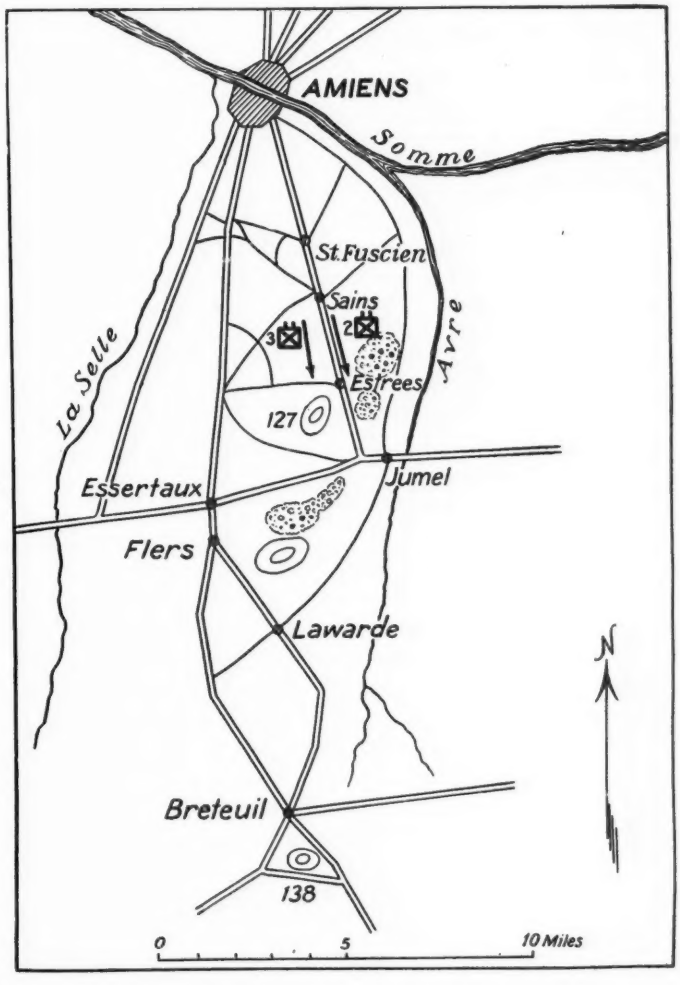
The artillery commander arrived and reported to the regimental commander, stating: "My guns can be in position in two hours, Colonel."

The regimental staff proceeded by bounds to a small building where it settled down temporarily. Meanwhile, the attached tank and antiaircraft unit commanders reported, and the staff was complete.

In about ten minutes, Captain Masuis, the regimental adjutant, proceeded through shell fire in a motorcycle sidecar to the division command post to receive the attack order.

The battalion motorcyclists returned to their units.

Presently, the regimental command post was removed to the southern exit of Sains. The regimental staff drove ahead in its special vehicle. The French artillery was firing on Sains. Nobody knew the situation on our left, not even the regimental adjutant. But as motorized troops we were accustomed to that. The command post was established and all vehicles were placed under cover, off the road. Telephone connection was made with division and the regimental staff again sat in the road-side ditch. The Camon woods could be seen to the south. Elements of the 3d Battalion soon appeared en route to their line of departure.



Suddenly, the regimental command post had to be removed about 500 yards farther south due to the French artillery fire on the southern edge of Sains. The regimental adjutant accompanied the telephone, while the assistant adjutant observed forward through the "scissors" telescope.

Motorcycle messengers moved out to notify the units concerned of the change in the location of the command post.

The 2nd Battalion was ordered to prepare to attack in the direction of Estrees.

At 5:00 PM, the 3d Battalion reported that it was in a position in readiness in the Camon woods.

The attack began at 6:00 PM at which time our artillery opened fire on Estrees, which the 2nd Battalion was to attack. The regimental commander observed through the "scissors" telescope.

The 3d Battalion in extended order formation, and supported by tanks, led the attack. On the left, in the valley opposite the Camon woods, the 2nd Battalion began its advance. The regimental commander also observed this action through his "scissors" telescope. He saw the riflemen suddenly take cover on the ground. They encountered heavy firing from Estrees at a range of 200 yards. It was feared that the artillery preparation was insufficient. The 2nd Battalion had no special means to oppose this fire except machine guns and mortars. All the tanks were attacking with the 3d Battalion.

In 10 minutes a motorcyclist arrived from the 2nd Battalion with the report: "We are receiving heavy fire from Estrees. Machine guns firing from sandbag emplacements in every cellar door. Preparatory artillery bombardment not successful. The enemy runs down into the cellars when fired upon. As soon as the fire ceases they come up again to their machine guns."

A motorcyclist from the 3d Battalion also arrived. He handed the colonel the following message: "Hill 127 has been taken."

The colonel wrote on the back of this report the following order: "Attack to be continued up to the Essertaux-Jumel road. Give tanks to 2nd Battalion!"

The following order was sent to the 2nd Battalion: "Push past Estrees!"

The regimental commander desired to avoid heavy losses in village fighting and therefore postponed the attack on Estrees. Artillery support against Estrees was again requested in order to prevent fire into the flank of the battalion while advancing around this village.

The tanks then moved from Hill 127 to assist the 2nd Battalion. They opened fire on the eastern edge of the village (Estrees). The riflemen of the 2nd Battalion sprang up from their cover on the ground and advanced just in rear of the tanks. Some enemy machine gun nests were encountered and put out of action. German dive bombers operated against the town, silencing the hostile fire emanating therefrom. The 2nd Battalion pushed past Estrees, as ordered and gained contact with the 3d Battalion on the Essertaux-Jumel road.

The regimental commander then decided to launch an attack on Estrees at 9:00 PM. All available weapons, including artillery, antiaircraft and armored assault artillery, were placed in position and opened fire on the village from three directions. The antiaircraft guns destroyed the water tower and the church steeple, causing the enemy observers to abandon their posts in haste.

The 1st Battalion attacked Estrees from the north, finally rushing the village. A reconnaissance detachment commander with a dozen grenadiers, accompanied by a captured French captain and lieutenant, proceeded from cellar to cellar. French troops were captured at various points as they emerged from their cellars to return to their machine guns. The village was thoroughly mopped up. Hand grenades were thrown into the cellars which still resisted. Altogether the battalion took several hundred prisoners. A map was found, which showed the French defensive positions.

Action on 7 June

The large Berny woods is just over the hill south of the Essertaux-Jumel road. Projecting northeast from this woods is the small Bois de Varinois. The regimental commander ordered the 3d Battalion to hold the hill south of the road, and the 2nd Battalion to furnish protection towards the east.

The energetic commander of the 3d Battalion pushed his men beyond the hill, driving a deep wedge into the French position between Flers and Berny woods. The French, recognizing the threat, brought concentrated artillery fire upon the 3d Battalion and also on the 2nd Battalion attacking to the left rear of the 3d Battalion.

The 1st Battalion was then moved into an attack position on the left flank of the regiment and it advanced to within 300 yards of Berny woods.

In the meantime, the regimental command post was advanced and the command post group drove rapidly ahead to a sunken road near a farm where the vehicles were placed under cover. The staff continued on foot.

Apparently, French observation posts noted the dust clouds made by the vehicles because the staff had scarcely dismounted before they came under small-arms and shell fire, directed at the sunken road. However, only one vehicle was demolished.

The regimental command post then moved still farther ahead.

The 2nd Battalion, after capturing the Bois de Varinois, was subjected to a severe French artillery barrage and finally came to a standstill abreast of the 3d Battalion.

The tanks, now operating with the 3d Battalion, opened fire at long ranges. They could not advance farther due to minefields. The entire forest had been transformed into a wire entanglement with a minefield in front of it. French machine guns were operating in the forest and to get at them constituted a knotty problem.

Artillery fire was requested. The fire from the tank weapons also had its effect. Several hundred Frenchmen soon stepped out of the woods and surrendered. The 3d Battalion immediately advanced into the forest, removed the mines and barbed wire and started to mop up, moving northeast (towards the 2nd Battalion). The tanks remained at the edge of the woods.

It was subsequently learned that at least three French artillery battalions were in position on the high ground south and southwest of the woods and these weapons were placing direct fire into the western part of the forest causing heavy losses in the 3d Battalion.

The attack was stopped in order to effect a reorganization of the heavy weapons, especially artillery.

The division commander then announced that there would be a general attack of his entire command on 8 June, with the utmost artillery preparation and airplane support.

In the evening of 7 June, the pioneer assault battalion in stubborn house-to-house fighting with flame throwers and

hand grenades mopped up Flers and Essertaux, which really formed one large village. Several hundred prisoners were captured in this action. After dark, preparations were made to renew the attack. The German artillery remained silent until morning when dive bombers arrived and operated upon the woods as well as the village of Lawarde.

The enemy retreated in the face of the renewed attack and the pursuit was continued to Breteuil, which was reached in the evening. At this time, all the heavy weapons went into position on Hill 138. From this hill the remnants of the French forces could be seen retreating to the southeast. The artillery began its fire of annihilation. At the same time our motorized troops rushed madly ahead into the flank of the fleeing French. We kept up the pursuit until the French forces were completely surrounded and succumbed.

The Panzer Divisions

[Condensed from an article in *The Tank* (Great Britian), June 1941.]

In tracing the development and strategy of the panzer division there is no need to go back to the sorry story of the lead that Britain lost from the time, many years ago, when experiments were first made on Salisbury Plain with tanks operating with close-support aircraft. Earlier German adventures on the Continent gave them the advantage of developing their armored formations by a system of trial and error. They learned a great deal about maintenance and supply during the march into Austria, when many of their tanks broke down badly; the role of the dive-bomber had been deeply studied in Spain; and during the Polish campaign, from which they emerged by no means unscathed, it was found that the armor of the German tank did not resist the armor-piercing bullet, and the enemy therefore spent the winter in thickening it before unleashing the full fury of his *Blitzkrieg* against the Low Countries.

All Arms in One Unit

From the beginning the Germans discerned that the tank could not operate alone, that the cooperation of all arms in a self-contained unit was an indispensable factor in its future. So the panzer division was built up, each with its own squadron of supporting aircraft, which by the maintenance of a close wireless link could be summoned within a remarkably short period, and within the division are a brigade of lorry-borne infantry, a mechanized reconnaissance unit, which in the form of advance "clouds" of motorcyclists played such a prominent part in France, a regiment of field artillery, an antitank battalion, a heavy-machine-gun battalion, and an engineer battalion carrying bridging equipment, besides a thorough system of ordnance field workshops, with a light aid detachment attached to every tank battalion. The core of this hurtling spearhead, which is not without a certain resemblance to a gangster's bodyguard, is the tank brigade consisting of two regiments, each of two battalions of 100 light, medium and heavy tanks. The whole organization, swift and flexible, makes for a high degree of reconnaissance and hitting power under the hand of the foremost leader.

The panzer division without question has established itself as the *corps d'elite* of the German army. After the Polish campaign all the existing S.S. divisions were motorized and turned into armored formations, and it is significant that most of the German division commanders are men with wide experience of the General Staff. The initiative and standard of junior leadership were seen in France, where it was a common experience to find a troop of tanks, with a section of antitank guns and a few armored cars and motorcyclists operating in the open as self-contained units.

The divisional commander and his staff have their armored command vehicle, similar to our own, and a highly developed system of communications is almost entirely by wireless. The most recent trend is to reduce the number of tanks in the division to about 300, which would partly explain the rapid expansion of divisions. The enemy, moreover, must have captured nearly as many tanks as he lost in the occupied countries. An obsolete Polish tank served its purpose for training; others were converted into flame throwers; but the Czech Skoda works turned out an excellent light-medium tank, which came up against the British forces at Calais. One division from Prague, indeed, is equipped entirely with Czechoslovak tanks. The German light-medium tank, of which there are many, weighs between 18 and 20 tons, is very fast, and carries a crew of three. It is armed with a 37-mm gun and two coupled machine guns, and has armor of about 30-mm.

The tendency is for the light tank to be discarded and to substitute a heavy tank for the medium. This heavy machine, really a cruiser, has a crew of five, a 75-mm gun, and two machine guns, and carries a good deal of ammunition. Its speed on the road is about 30 m.p.h. A good deal was heard during the Battle of France of a German juggernaut of between 70 and 100 tons, but the authorities have no evidence that the enemy used a tank heavier than 56 tons, though he probably has one now. These examples, by no means complete, may give some idea of the weight of metal in the panzer division. The methods of its employment, supported by the dive-bomber where serious resistance is encountered, were only too apparent during the fight for France.

System of Supply

The enemy has developed his system of maintenance and supply to a remarkable extent; in Flanders his armored formations were often refuelled by air, even at the cost of crashing his aircraft. Dispatches to *The Times* during that period, however, described how vulnerable were his huge supply trucks rushed up behind the tanks, though the retreating French forces certainly contributed to their own undoing by not destroying existing stocks of oil. But any consideration of the headlong career across France of German tank formations must be governed by the fact that they outnumbered those of the Allies by at least five to one; as it was, they must have been on their last tracks when the end came, just as many of them must be now in Libya. One division took part in the first breakthrough at Sedan, finished up near Calais, and was later identified south of the Somme.

The expert view is that in strategy and tactics the panzer division does not depart from the old German doctrine of envelopment carried out with great speed and striking power by a surprise concentration at the vital point followed

by infiltration. It is extremely strong in reconnaissance employed in finding the weakest spot, and here profitable use is made of the motorcycle. Once a wedge is driven in, the tanks penetrate as deeply as possible, striking at communications, gun lines, and headquarters; and usually when an obstacle is encountered their flying artillery is within swift call. And, as we have seen, some of their tanks are mobile artillery. It was remarkable in France how they would sometimes put in two or three waves of attacks on a front of no more than 1,500 yards. The heavier tanks went in first against stiff opposition, but when they were through the motorcyclists and armored cars would race ahead, leaving chaos and confusion in their trail, while the motorized infantry completed the operation by winkling out resisting nests of machine or antitank guns. Unlike ours, the German tank gunner is trained only to fire from a stationary position, and here we enjoy a distinct superiority.

The Attack on Festieux by the 5th Company, 75th Infantry, and the March to the Aisne, 20 May 1940

[Condensed from an article in *Militärwissenschaftliche Rundschau*, November 1940. Translated from the German in the Translation Section, the Army War College, Washington, D. C.]

To secure the right flank of the regiment was the mission assigned the 2d Battalion, 75th Infantry, reinforced by the heavy machine-gun squad and mortar squad of the 8th Company, 19 May 1940. Company orders were to move out to the right, advance through Montaigu, gain the south edge of the woods two kilometers south of Montaigu, and secure the regiment over night in that position. Unnoticed, the company crossed the open plain into Montaigu, despite the fact that six hostile tanks had been observed parked under trees two kilometers northwest of Montaigu. Crossing the densely wooded ridge south of Montaigu under considerable difficulty, the company reached the designated security zone at 2:00 AM, 20 May, after covering a distance of 18 miles.

At 8:00 AM, the company received orders as follows: "The reinforced 5th Company will move on to Courtrizy and establish outposts there. Small security elements will push on south to the Reims road."

By 10:00 AM, the 5th Company arrived at Courtrizy, finding the village clear of hostile troops, and established outposts. Two squads had orders to advance to the Reims road. Moving forward, they drew machine-gun and rifle fire from the south, the direction of the Reims road. However, the opponent withdrew shortly. An antitank gun of the 14th Company (antitank company) arrived and was directed to establish cover against hostile tanks at the Reims road. As the two squads reached the road, the antitank gun clashed with hostile tanks (four 18-ton tanks, an armored car and an armored ammunition carrier) that had driven up from the direction of Festieux, following the trail which leads through the woods just south of the Reims road. Replying to the fire of the hostile tanks, the antitank gun shortly was caught between fire from several directions and its crew killed. The hostile tanks continued to fire for a while on the security elements along the edge of the woods and then turned back toward Festieux, driving along the Reims road. (Festieux is about 4½ kilometers southeast of Eppes.)

That moment, a second antitank gun—which the company commander had ordered forward as soon as he learned that hostile tanks were present—reached the position of the two squads and was directed to a favorable location.

The six armored vehicles of the enemy immediately turned about and resumed their attack on the security elements. The armored car and one of the 18-ton tanks were destroyed by the antitank gun and the armored ammunition carrier demolished at close range by two hand grenades. The other three hostile tanks escaped toward Festieux.

By that time the 5th Company was displaced as follows:

One platoon was placed along the edge of the woods just north of the Reims road, front facing south. Two platoons were strung out in the woods southeast of Festieux; one of them occupying the part north of the Reims road, the other that on the south side of the road, both facing Festieux. The company CP, with a machine-gun squad and a heavy mortar squad, was set up close to the location of the platoon on the south side of the road. While the antitank gun remained in its position, the antitank rifle (*Panzerbüchse*) went into position close to the road.

At 1:00 PM the company commander observed, on the road approaching Festieux from the north, a long column of hostile motorized forces, including motorcycles, armored cars, trucks and ten 18-ton tanks. Immediately he ordered the heavy mortar squad and heavy machine-gun squad to open fire on the hostile vehicles now deploying at the north entrance of Festieux. The effect of the mortar shell, fired at a range of 1,300 yards, was terrific. The enemy was a mass of confusion. Some vehicles tried to escape. Three tanks left hurriedly; the other seven, a motorcyclist in the lead, made a dash against the reinforced 5th Company whose position was favorable. The motorcyclist was shot down immediately. The leading tank was destroyed by the fire of the antitank gun, as it was about to penetrate the line of the company. The next tank met the same fate. The remaining five tanks turned back into the direction of Festieux; while one of them went up in flames shortly before reaching the village, its crew escaped.

Four hostile armored cars now could be seen approaching Festieux from the north. At the same time, the main body of an antitank company arrived at the CP of the 5th Company on the Reims road and immediately opened fire with all available guns at 2,000-yard range. Although the armored cars suffered but slight damage, the crews deserted their vehicles and fled on foot.

At 3:30 PM, the commander of the reinforced 5th Company decided to launch an assault on Festieux. By 4:15 PM, the company was in position to attack from the east.

LAON PF
Eppes
Chivy
Laval
Montcornet
Pleyart
Nouvion
Neuville
Pontavert
Pont-Arcy
Maizy
Beaumont
Chaudardes
Corbeny
Vauxtin
1000 500 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Metres
Hect. 10 5 0 1 2 3 4 5 6 7 8 9 10 Kilomètres

The ensuing assault met with little resistance, offered by individual riflemen. The greater part of the enemy was taken prisoner. The four armored cars and a large number of motor vehicles fell into the hands of the assault troops. So far there were no casualties on the German side.

The battalion commander meanwhile had received orders to reach the Oise-Aisne Canal at and southeast of Braye-en-Laonnois that same evening. When the battalion took up the advance, it was still without news of the situation on its right and left. Tank and flank attacks could be expected momentarily.

The grass to the right of the road was still bent to the ground, evidence that the French troops had just departed. The fire in a deserted fireplace was still smoldering. Suddenly the commander of the leading echelon of the battalion shouted a warning: a barrier of timber, planks and trees was blocking the road. The officer thought he had seen a movement. Bringing the antitank gun into position was a matter of seconds; a shot rang out and swept a part of the barrier out of the way. Not a sign of life was behind it.

The orders were to reach the objective by daylight, though feet were tired and eyes smarting from the dust.

Passing through Chamouille, the battalion reached a crossroads. The road sign pointed to the Chemin des Dames, Ailette, Cerny.

The battalion marched on through the valley without securing its flanks, heedless of any enemy that might be lurking in the hills on the right and left. As if by some miracle, the advance encountered no interference, however. The retreating French forces had left the village behind them in a state of pillage and destruction.

A wide paved highway extends through the valley of the Ailette and leads toward the dominating broad ridge along the Chemin des Dames. To the right and left of that road, hardly a spot of ground is left that was not plowed under several times during the World War. Not a single large tree with a real trunk can be seen far and wide. Roots have come to life again and the stumps grown into bushes. The old shell holes by the side of the road are filled with murky water. Over to the right, there lies an old trench, its walls collapsed, and in front of it a rusty wire entanglement.

Were the French asleep? Why had they decided to give up this vital ridge without firing a shot? Certainly they remembered its importance from the days of the World War.

When the advance guard of the battalion arrived at the foot of the Chemin des Dames, the sun had been down for an hour. The battalion continued its march up the winding road to Cerny. The sound of machine-gun fire could be heard in the distance. As the advance guard entered the village, a shot rang out from a house, with five or six more shots following in rapid succession. A squad immediately went into action, beat down doors to search buildings, when a lone French soldier appeared—evidently asleep while his comrades left.

Still the battalion kept marching on. At 10:00 PM, the companies branched off into their respective company zones. Signal elements followed them, prepared to establish telephone communication at a moment's notice. French artillery was not ready to open fire, or failed to notice the approach of the battalion in the dark. It was able to cross the barren slope along the Chemin des Dames without interference.

"Forward" was the password of the day; every step forward meant that much more ground gained, ground which it would not be necessary the next day to wrest from the hostile artillery.

Airplanes Supply Tank Ammunition

[This is a digest of an article, "On the British Air Field in Larissa (Western Greece)," by War Correspondent Werner Kark, appearing in the *Völkischer Beobachter*, 21 April 1941.]

We circled over the air field of Larissa. Our pursuit planes were already on the field. As late as yesterday the English and Greeks took off from this field. The first German machine landed here this morning, a few minutes after the occupation of the city.

The ammunition was quickly unloaded. The tanks were soon to have a fresh supply of ammunition. In the meantime we briefly explored the air field which the enemy lost.

A creaking door was opened that led to the quarters of the flying personnel. On the tables was bread cut perhaps only a few hours before. There was a chaos of knives, eating utensils, tin cans, articles of equipment, letters, newspapers and packs. English signs on the walls showed that it was the British whose meal had been disturbed. The sleeping quarters and offices showed similar signs of hasty departure.

Our ammunition had been unloaded in the meantime. Automobiles and motorcycles took it at top speed to the tanks, which had passed through Larissa some time ago. Then we took off to bring up additional supplies to the front on the same day.

German Advance Guard in Action—Crossing the Seine

[Condensed from an article appearing recently in the *Deutsche Allgemeine Zeitung*, a Berlin daily newspaper, under the title, "Tanks in Combat—Crossing the Seine, June 13, 1940."]

Editorial Note.—There are several things brought out in this narrative that are worthy of note.

Barricades to be effective must be well protected. In the removal of these the cooperation of all advance units should be noted.

The German tank units did not bother about ineffective resistance but let troops coming up later take care of it.

This advance guard apparently consisted of pioneers, motorcyclists, motorized rifle companies in addition to the reinforced platoon of tanks.

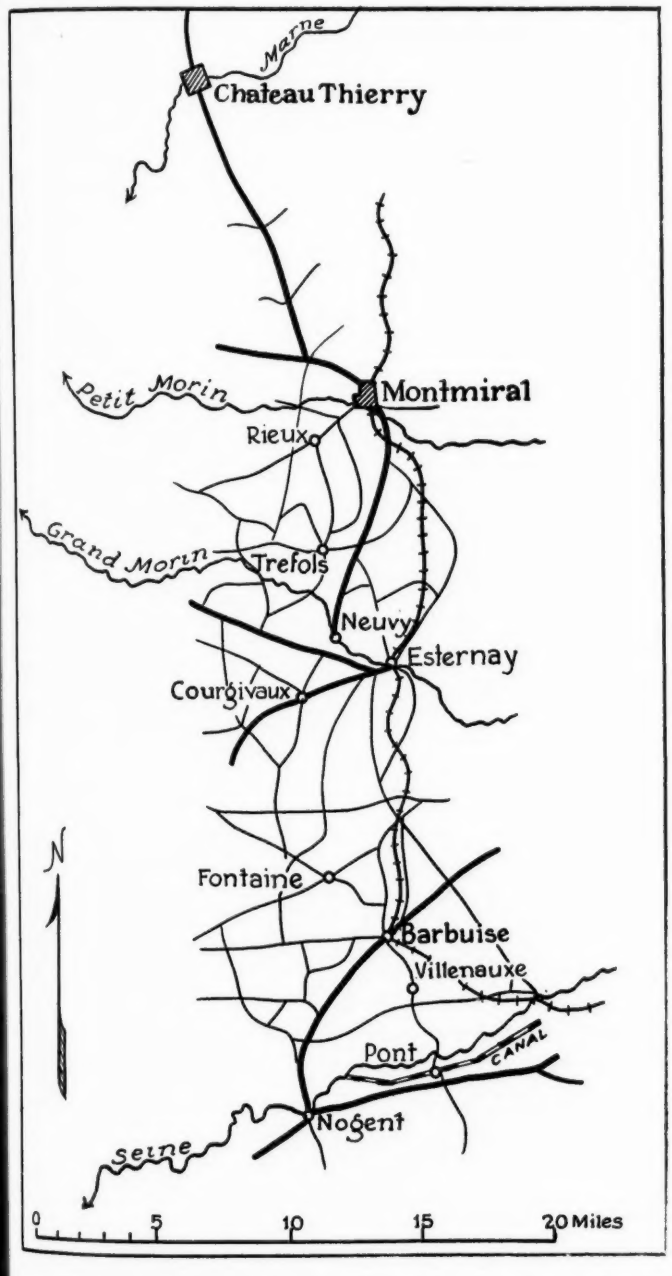
The tank platoon was the point of the advance guard and the advance guard was sufficiently strong in combat power to clear the way for the main body.

* * *

We were ordered to break camp on the afternoon of 12 June and cross the Marne at Chateau Thierry early the next

morning. . . . My heavy half-platoon was attached to the 1st Battalion Light Platoon under command of First Lieutenant B. It was rumored that we were to march towards the south.

Presently, I held the order for 13 June. It read substantially as follows: We were to be the point for March Group East. The contemplated operations of the entire army depended upon the speedy and successful execution of our mission. The enemy, wherever met, was to be repulsed vigorously. Swift execution of our mission would spare blood. As the point of the advance guard battalion, we were to push south, cross the Seine at Pont sur Seine, promptly capture the bridges there in order to cut off the retreating French Army.



The group constituting the point was assembled at Rieux to discuss plans in detail with the advance guard battalion commander. To our left front we could see Montmiral in flames. It was in our hands.

At 11:30 AM the point moved out on its 40-mile march southward. We knew nothing concerning the whereabouts of the enemy, but assumed that he would put up a strong defense, wherever encountered. Hence, each village was closely observed.

When we finally arrived at the crest of a hill we surveyed the terrain for several miles ahead through our glasses. On the distant horizon we saw some columns on the march, but could not identify their uniforms. We assumed they were French, so we speeded up.

Just before arriving at Trefols we encountered the enemy for the first time. It was quite a large group of Frenchmen resting in the tall grass and they were taken completely by surprise. At first they remained quiet, apparently hoping they would not be discovered. After we opened fire and killed several of them, they began to crawl out of their hiding places. We jumped from our tanks and took prisoners in increasing numbers. Altogether, we assembled about 300 of them, and then marched on.

In Trefols, we put a 47-mm antitank gun out of action and captured a 150-mm piece, then our route took us through Neuvy, Courgivaux, Fontaine and Villenauxe. No serious resistance was encountered. In the far distance, on the right and left, we could see both large and small enemy columns moving along, unsuspicious of our presence. In Neuvy, we clashed with a column approaching from the opposite direction. Two French officers riding in a passenger car were killed by our machine-gun fire. Several tanks sent out as a left flank guard completely annihilated some hostile cavalry.

A little later a French colonel stepped from his car and surrendered when he suddenly found himself confronted by German tanks He was supposed to be responsible for covering the retreat of the French Second Army, and accordingly he had organized the resistance on the Seine.

Eventually, we arrived at a steep curve in the road leading down to Villenauxe. Just as we were about to rumble into the little village, a marching column emerged from the woods across the valley beyond the town and marched toward us. Our machine gunners could not be restrained. . . .

The entrance into the town was blocked by a strong barricade consisting of pile-work and a burning ammunition wagon parked immediately in rear of it. Also a bridge had been blown up. However, the enemy had left one road open and we did not hesitate to use it. As a precautionary measure we fired into the cellar doors and into the windows of the nearest buildings to guard against surprises.

We soon found an exit from the crooked streets of the town. We knew that the Frenchmen had withdrawn into the cellars, but this did not detain us.

Then something happened that might disrupt the plans of the keenest strategist—a heavy cloudburst. In spite of closed doors, the water ran down our necks and into our sleeves. We could see nothing through our telescopic sights and the vision glasses in the tank commander's turret were constantly blurred. Moreover, dusk was approaching and our objective was 10 miles ahead.

We continued in the pouring rain, overtaking refugee columns on the road. French soldiers among these refugees fired on our motorcyclists.

When the rain stopped, I contacted First Lieutenant B. on the radio and suggested we speed up, for it would be impractical to operate if night should overtake us. We still had seven miles to go, so we drove at top speed on the good road, paying no attention to the enemy fleeing from us, right and left.

Eventually we were breezing along like automobiles. The No. 1 gunners observed on both sides for antitank guns. The radio operators had their hands full, since brief contacts were frequently made between the platoon commander and his individual tanks. Specific tasks were assigned, insuring observation in all directions. Some turrets were turned to the right, some to the left and some straight ahead. The drivers were at all times prepared to leave the road, if necessary to avoid antitank-gun fire.

We passed through Barbuise, approaching close to our objective. All nerves were strained. We wondered if the bridges would be defended, or if they had been destroyed. Our point was a rather small group to prevent the execution of demolitions, already prepared.

Finally, the first bridge was only a few yards ahead of us. It was across a small tributary of the Seine. Beyond this bridge, the road curved to the right and revealed the bridges across the Seine itself.

Just before arriving at the Seine tributary bridge, First Lieutenant B., in the foremost tank, stopped for a brief look at the terrain. I moved my two heavy tanks forward to positions just behind him, ready to deliver protective fire, if necessary. We observed carefully, uniformly turning our turrets to the left. The remaining four tanks soon closed up, just behind us.

Suddenly, the enemy opened fire. Artillery projectiles fell upon the bridge and in front of us. Their aim was a little short. Machine-gun and rifle fire came from the edge of the woods ahead of us.

We were halted at the edge of a level, open field, about 600 yards square, enclosed on all sides with groups of woods and trees, where the enemy was excellently concealed. We swept the edge of the woods with machine-gun fire. A flash flared up from the edge of the woods on our left front. All cannon soon centered on this point, but the enemy continued to fire, his artillery and antitank-gun projectiles striking close to us. Apparently, we were in a predicament. It was impossible to stay there and we wondered whether we should withdraw and await the advance guard. Suddenly, the radio command of First Lieutenant B. came into our ears: "Forward! We will take the bridge. Follow me!" He was the first to cross, and just behind us followed the motorcyclists and pioneers. On the other side we quickly turned off the road and kept the enemy down with our fire. The riflemen jumped from their motorcycles and moved ahead of us. They were protected to some extent by a slight fold in the ground. We were still 350 yards from the big bridge across the Seine.

Although we succeeded in eliminating the flanking fire, the hostile artillery continued its direct fire at short ranges. The platoon commander took advantage of a pause in the firing to radio the approximate position of this enemy artillery piece to one on his heavy tanks. A direct hit put the enemy gun and its crew out of action. The artillery fire ceased, but the machine guns started in again. Whereupon, the tanks went to the aid of the advancing pioneers by moving into positions close to the bridge, whence they silenced the enemy machine guns with grazing fire.

Meanwhile, the pioneers blew up the large tree barricades at the entrance to the bridge and dragged off the refugee vehicles parked just beyond. A motorcycle platoon then lent a hand by rushing across the bridge into a building at the left near the road. They set up a machine gun and put an enemy antitank gun out of action. Unfortunately, our tanks took their building under fire. In the excitement, we had not noticed that it was already in our hands. A tree barricade had to be removed from the center of the bridge before our tanks could cross. This barricade was covered by strong machine-gun and artillery fire. Here the motorcycle riflemen assisted again. With the aid of pioneers they removed the obstacle, after the enemy's fire protecting it was eventually silenced by concentrated fire from our tanks, antitank guns and machine guns.

Flanking machine-gun fire still held up the assault of the other ground troops across this bridge. All our tank machine guns fired savagely upon suspected hostile positions. As soon as the hostile fire subsided for a moment, more riflemen rushed across. The first tanks followed immediately in a mad dash. Then a rifle company from the advance guard battalion suddenly appeared. During this engagement we put a 25-mm and a 47-mm antitank gun out of action.

A large canal bridge was still in front of us. The tanks moved up and covered the retreating enemy with fire, while the riflemen rushed ahead and removed the bridge barricade, thus permitting the tanks to cross. This made three bridges safely in our hands.

The Supreme Command of the Army under date of 17 June 1940, reports:

"The collapsed French armies are retreating en masse with strong indications of disintegration toward the south and southwest sharply pursued by our troops.

"The Fast Troops (Schnelletruppen) pushing ahead into Burgundy and through Langres have made headway towards the south. Southeast of Besancon, the Swiss frontier was reached, thereby closing the ring around the French forces retreating from Lorraine and Alsace."

Mobile Armored Units in Mountain Defense

[From an article in *Revue Militaire Suisse*, March 1941. Translated and condensed from the French at the Command and General Staff School, Fort Leavenworth, Kansas.]

The unprecedented success of armored vehicles and of special assault troops in the present war brings forward the question of the value of permanent fortifications.

Modern warfare shows us that permanent works of fortification alone cannot arrest the enemy; indeed, that he can even put them out of commission in a short time. The emphasis in defense must not, therefore, be placed solely on permanent works of fortification but also on field forces who must be provided with mobile, armored engines of warfare. Only an army thus equipped will be able to cope successfully with the assailant's efforts at penetration. This is true not only for plains fighting but for mountain warfare where

tanks, parachutists, aerial infantry employing helicopters, and special assault detachments are also employed.

An armored fortress has accomplished its mission when, with a suitable garrison, it has been able to hold out for a time against an enemy of superior strength. The effects of the fire of the defender must be increased to the point where they will force the assailant to adopt the slowest and most difficult manner of attack, exposing himself at the same time to the most effective fire of the defender. The location of the fortresses must be so chosen as to permit of offensive as well as of defensive action over a given front. The defensive front should present great pliability in depth. Motorized reserves, capable of rapid movement, guarantee the maintenance of the front. The defender must try to minimize his losses as much as possible. He has two means at his disposal for this end: armor and camouflage.

For mountain defense, the combat tank is just as necessary as in attack. The defender can employ it on the one hand as a mobile reserve, on the other hand as a mobile, armored fortress.

In the mountains, the use of tanks as mobile fortresses requires the exercise of special tactics. The tanks must be assigned to the infantry as accompanying equipment and employed in several lines. They serve for repelling enemy tanks and as a weapon against the heavy infantry arms. It is therefore necessary that they occupy carefully camouflaged positions. Depending on conditions, they should be buried and covered by camouflaging screen or else placed in special positions such as barracks, quarries, bends in the road, etc. If these mobile fortresses are painted with suitable colors, they will be very difficult to distinguish and hit. They cannot be put out of commission except by direct hits by heavy infantry or artillery guns, weapons which the assailant will not be able to use in more than a limited way in the mountains. A buried armored vehicle escapes completely the effects of bursting shell fragments. A tank which has been sighted can change position and thus escape the fire of the artillery.

Tanks may also be employed singly, for example, for keeping watch over a defile, a ravine, a hill crest or for the protection of a flank. In such case, the position must also be carefully chosen and camouflaged so as to attain to the maximum of effectiveness. Sectors which are not fortified can in this way be very quickly organized for efficacious defense; the same is true of positions which have been taken from the enemy. In all cases where tanks are assigned to the holding of positions, they must be well camouflaged and given distribution in depth so that the assailant will keep encountering new obstacles.

The tank may also be used to complete the network of permanent fortifications and for intermediate positions. The dimensions of the resulting strong point are determined by the terrain. It offers but a small target to the enemy while giving out a great volume of fire, and this without mentioning the advantages which its mobility give to it.

In the mountains tanks can be used as tactical reserves for the purpose of local counter assaults or counterattacks. They must be stationed in such a way as to escape the eyes of the enemy as well as the effective fire of hostile artillery. At the same time they must be able, if the enemy should unexpectedly penetrate into the position, rapidly to reach the critical points. Their employment should be worked out in all details in advance, particularly as regards routes to be followed and the probable nature of the terrain where they will be employed.

If the enemy is repulsed, the reserve will be employed in the pursuit; if we are forced to retreat, it will cover the retreat. In the mountains, tanks are particularly well suited to delaying-action resistance.

The armored tank possesses all the advantages of utilization of terrain and of mobility without the inconveniences of the fixed forms of permanent fortifications. It possesses, nevertheless, in full measure, the force of resistance sought in these fortifications. A nation which looks for its protection to the walls of its mountains alone, is exposed to grave disillusionment, if it persists in such a condition of mind.

The mobile armored fortress must be an automobile vehicle of a special type—able to travel over all terrains, heavily armored in front, on the top and sides and equipped with cannons and machine guns. It must be provided with winches in the front and rear so as to be able to draw itself over difficult terrain. It must be provided with the means of radio communication. Its speed must be reduced in order that it may have greater climbing power. Its length, width and height as well as its terrain characteristics must correspond to mountain conditions. There must be several categories from the viewpoint of weight, as, for example: light tanks for 2 men (5 tons), medium tanks for 3 to 4 men (12 to 14 tons), and heavy tanks (20 to 30 tons) with a crew of from 6 to 8 men. In accordance with the conditions of the mountains, the tanks will form in special columns for the march or else will form part of mixed columns. The armament of the light tanks should include an automatic cannon of 20-mm to 30-mm and a heavy or light machine gun. The medium and heavy tanks should carry heavy machine guns and 47-mm cannons; the heavy tanks, even field pieces.

These are, roughly speaking, the characteristics of the mountain car for mountain defense.

* * *

Editorial Comment.—Mountain defensive positions must be organized in great depth as well as those on less difficult terrain. When one point of a defensive position is pierced the entire position is endangered.

The German Breakthrough into Greece

[Condensed from a sketch which appeared in the authoritative German newspaper, *Völkischer Beobachter*, 18 April 1941.]

The Terrain

The few roads that lead into Greece run through deep narrow mountain valleys, and there are no other routes over which an invading force can pass. The points at which these approach roads debouch from the mountains are, however, on Greek soil, and at the time of the German march into Greece they were blocked by strong fortifications of all kinds. Figuratively speaking, the Greeks had their barrier forts arranged like stoppers at the end of long, narrow bottlenecks. These stoppers had to be pushed out if the way

was to be cleared southward to the Thracian and Macedonian plains, towards Salonika, and to the Aegean. The flight to accomplish this end was the first phase of the campaign in the southeast.

Enemy Situation on the Day of Attack

The Greek defense of the mountain exits had been developed into a system representing a continuation of the Metaxas Line. This defense system, organized in the years 1938 to 1940, when our West Wall was built, was a modern system consisting of armored works, concrete bunkers, field fortifications, and searchlights and alarm stations. All these were built in accordance with the latest military experience.

The works were located deep in the rock, and the fact that their checkerboard arrangement enabled one bunker to cover the other made the capture very difficult. In and behind the line of fortifications was the Greek Macedonian Army of approximately 50,000 men—about four active divisions and one reserve division under the command of General Bakopulos.

Nearly all of the Greeks were under 23 years of age. Since all of them had been in the army at least since the spring of 1939 and in the Metaxas line for at least six months they were well acquainted with the works, operation of the equipment, and localities. In addition, they had been given plenty of practice in the use of the arms of the fortifications. There were very strong fortifications on both sides of the passes. There were no Englishmen found in the first line, but the best of the Greek forces were located in the fortifications.

At 5:20 AM on 6 April, 1941, German divisions set out over all the approach routes to attack Greece. The first works were captured in hand-to-hand fighting, but we soon found that we had in the Greeks an extremely brave adversary. It was not easy for our Stukas and heavy artillery to get to them, particularly on the right wing and in the well placed mountain fortifications. Bunker after bunker had to be taken, because the separate works, which were so connected that they could cover and assist each other with their fire, threatened to stall the German advance at certain points. They offered a good distant view towards Bulgaria and into the German assembly positions.

From all sides—even from the bunkers that had already been crushed—the advancing Jägers, riflemen, pioneers, and artillerymen continued to receive heavy fire. The mountain fortifications were arranged, like warships, on the principle of the bulkhead system; they were not decisively neutralized even after a considerable part had been destroyed and burnt out. All of the openings had to be filled and blocked and the openings to the works had to be blown up before we finally attained success.

The Greeks defended themselves bravely and stubbornly, but they were eventually forced to give way to the numerical superiority of the Germans, who would not allow themselves to be shaken loose once they got a foothold in the fortifications.

The thick fog and rain that came during the first night and the second day of the attack partly blinded the defense and aided the attackers. When storming one fort, we could not be seen by the artillery of sister forts; thus we could deal individually with one fort after another and even push in between works. During the first night, some of the attacking regiments succeeded in weaving themselves through the Greek lines and in capturing important points to the rear of the enemy—particularly bridges that were still intact. Whole battalions, however, were still fighting in the mountains.

The left wing did not appear to be as well garrisoned, and an attack by weaker German forces soon began to make headway. These forces first captured Komotini, then Xanthi; they later reached the coast of the Aegean.

The Decisive Tank Thrust

As a result of resistance in Serbia, German forces concentrating against Greece were confronted with an entirely new situation just before the attack. The whole right flank of the armies marching southward was threatened by the Serbs, and in order to avoid the danger of a Serbian thrust in the very region of the lines of communications, the German divisions, already deployed, had to be regrouped again a short time before the attack. Tank troops in particular were used for flank protection.

On the same day that they crossed the Greek frontier the mountain Jägers and the infantry advanced to the attack over the Bulgarian-Serbian frontier. They broke the light resistance of the Serbs on the frontier, pressed on in a westerly direction, made a swing of 90 degrees towards the south, broke through the Greek frontier fortifications, and then made a continuous advance through all of East Macedonia to the Aegean Sea.

While the mountain Jägers and the infantry were still engaged in a hard fight on the Metaxas Line, Salonika, the Macedonian capital which lay far in the rear of the Greeks, surrendered to our tank and motorized infantry formations. The tank thrust in rear of the enemy cut the Greek supply lines and surrounded their entire East Macedonian Army. Thus a further defense of the Metaxas Line would have been senseless.

Here in the Southeast we repeated what the world had already looked upon with amazement in the West, when our tank troops, advancing over the Aisne in the rear of the Maginot Line up to Switzerland, made useless a further defense of the French line of fortifications and forced the capitulation of the French in Alsace-Lorraine and in Burgundy. The tank thrust through Macedonia toward the South, carried out with scarcely any losses, resulted in the decision for which troops had been fighting hard in the mountains for three days.

Capitulation of the East Macedonian Army

The East Macedonian Army of the Greeks surrendered at about 1:00 PM on 9 April, 1941, after a fight lasting three and a half days.

Article I of the terms of surrender stated:

> "The parts of the Greek army fighting in East Macedonia are to lay down their arms. There is to be an armistice at once. Greek officers are to be allowed to keep their swords. The area of the East Macedonian Army embraces the part of Greece from the Turkish boundary up to the Vardar River."

Signing of the armistice marked the end of the first phase of the campaign against the British in Greece and those who allowed themselves to be led by the British. The

points at which mountain roads from Bulgaria debouch into Greece were in German hands. The breakthrough had succeeded.

The Shock Troop Engagement of the 111th Infantry Against Bachy on 24 May

["Das Strosstruppunternehmen des Infanterie-Regiments 111 gegen Bachy am 24. Mai," in *Militärwissenschaftliche Rundschau*, June 1941. Translated from the German and condensed at the Command and General Staff School, Fort Leavenworth, Kansas.]

On 24 May, the 111th Infantry arrives at the French border to the west of Rumes, about 12½ miles southwest of Tournai. The north portion of the extension of the Maginot Line, which belongs to the fortress at Lille in this sector, is directly opposite this place. The 3d Battalion has brought its advance guards up to within 800 yards of the line of bunkers at Bachy.

The precise course of the line of fortifications near Wannehain and Bachy is explored by officered scouting patrols. The exploration reveals all bunkers occupied. Part of the French are busy improving the wire entanglements and in the construction of field emplacements. Some run here and there, or sit on top of the bunkers, oblivious of the presence of the German troops.

After receipt of detailed information concerning entanglement positions of field emplacements, the direction in which the embrasures face the possibilities for approach, the observation posts of the heavy guns and their protection against gun fire, we are ordered to attack two of the bunkers in the vicinity of the village of Bachy during the evening. In case the resistance offered by the enemy is weak, the bunkers are to be taken, their crews made prisoners and the embrasures destroyed by explosives. In the event of stiff resistance, it is intended merely to harass the enemy.

The terrain is favorable for the attack. Two pieces of wooded terrain are well suited for the approach and preparation of the shock troops, for furnishing security on the right flank and the establishment of the requisite firing protection. The edge of one is situated 150 yards in front of the line of wire entanglements which passes in front of the right bunker. The northwest edge of the other wooded area is some 400 yards from either bunker. It offers a good observation post site for both the artillery and the heavy infantry gun detachment. In addition, from this position it is possible not only to keep the embrasures of the bunkers under fire but also to strafe the field positions in the intervening areas, and to make effective use of antitank guns from the vantage point of a rise between the two pieces of woodland. One especially advantageous feature is that crews of all the heavy guns can follow visually all shock group movements.

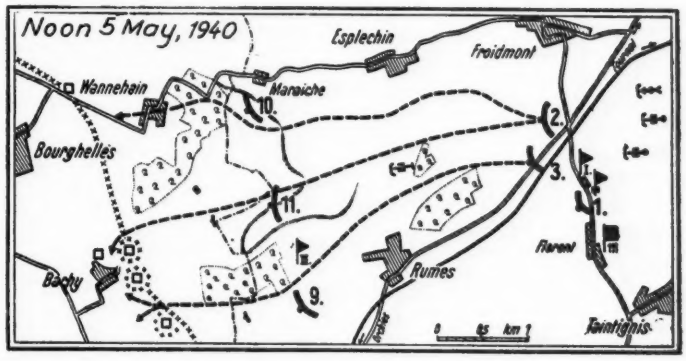
In view of these facts, the following plan of attack is evolved:

After a preliminary sudden burst of fire by all the heavy guns, the bunker on the right is to be attacked and taken by surprise. While this is going on the second shock unit is to creep up on the left bunker. Then, with the first group to outflank it, they are to attack and take it together.

The shock groups are made up of parts of the 2d and 3d Companies and a pioneer company. Firing protection is assumed by a heavy weapons infantry platoon, one platoon of antitank guns, two platoons of heavy machine guns, one regimental heavy mortar group and one regimental rifle troop platoon, in addition to two batteries.

The time for the attack is set at 10:00 PM.

At 8:00 PM the two detachments assemble in their places and on the line of departure.



Everything is quiet when at 9:50 PM the shock groups are ready to start. The engineers, who constitute the demolition unit, take a last look at the charges and examine the flame-thrower; the infantrymen check the machine gun to see that everything is ready. At 10:00 PM our artillery and machine-gun fire break loose with a roar. Shells from the heavy infantry weapons go flying into the wire entanglements, grenades crash against the embrasures. Both batteries fire faultlessly and lay down a heavy smoke screen over the terrain to the rear and sides thereby depriving the adjoining bunkers of their view and screening the attack toward the flanks. In one bound the shock troops reach the line of the wire entanglements. The engineers bring up the explosive charges. In a few seconds there is a frightful roar and the air is full of flying fragments of the destroyed entanglement. But not a shot from the enemy's position; no sign of opposition. The whole attack is carried out according to plans. Shock group No. 2 moves forward in short bounds toward the left bunker when suddenly we are covered from all sides by intense machine-gun and mortar fire. The heavy smoke screen obscures the view of the bunkers from our own shock groups for a few minutes, and they are not able to make out the field positions. Suddenly the enemy uses tracer ammunition. It is already fairly dark. Now our machine guns are able to reply to his fire. Our men continue to crawl closer to the embrasures, but the Frenchman keeps shooting his long-burning illuminating bombs so every movement must cease. Thus much time is lost. On the right a severe fight has broken out in the area occupied by a platoon of the 3d Company. In this place the enemy undertakes a counterthrust, which is repulsed by hand-to-hand combat. It is already 10:25 PM.

A new obstacle presents itself when we attempt to penetrate the defensive system entrance. There is a ditch, as deep as it is broad, in front of shock group No. 1. We lose men. The engineers look for a passage across the ditch but are unsuccessful due to darkness and heavy infantry fire from the immediate vicinity. As a last recourse, we decide to blow up the embrasures at the defensive system entrance. And

now, at 10:30 PM, hostile artillery fire opens and is laid down with disconcerting accuracy in front of the bunkers and on the emplacements of our heavy weapons. The second shock group, too, has been successful in breaking its way through the obstacles. An attack against the embrasure fails. There is still the task of warding off an enemy counterthrust which is only stopped at close quarters. At 10:40 the explosive detachment of the engineer troop has worked its way up and placed the explosive charge in front of the entrance. After a few seconds, there is a tremendous explosion. However, on account of the darkness, it is not possible to take the bunker.

By crawling over the ground, or moving in short bounds, the shock troops make their way back out of the barricade. Hostile artillery fire is now being laid down principally on the two wooded areas. Our own artillery concentrates its fire on the two bunkers and on Bachy.

The Atmosphere of the Battlefield

[From an article in *Ejercito*, July 1941. Translated and condensed from the Spanish at the Command and General Staff School, Fort Leavenworth, Kansas.]

In the German army the maximum of perfection has been attained in teaching the atmosphere of the field of battle, a practice which permits the preparation of the infantryman for the peculiar *climate* of battle. On the battlefield, very little is seen, but much is heard. The creating of that characteristic, sonorous atmosphere, the reproduction in a life-like manner of the effects of the projectiles with their clouds of smoke and columns of dust and earth, constitutes a veritable art which is worthy of study and imitation.

From the first firing exercises, the German soldier does not press the trigger of his gun nor throw a hand grenade without there being produced the corresponding shot or detonation. No dull imitations such as striking an ammunition box with a mallet to imitate the firing of a machine gun. In that country the guns, automatic arms and mortars really fire, and the soldier gets used to the effects of his weapons and gains confidence in them.

The creation of the atmosphere of the battlefield is attained in three distinct manners:

First, either individual or collective firing practice with the enemy represented by means of eclipse silhouettes making use of real ammunition.

Second, double action exercises in which the enemy is simulated in an actual manner by groups of men who occupy the positions which are the attack objectives. The defenders as well as the attackers employ salute cartridges and during the assault phase of the attack the hand grenades glow. The beginning of the artillery fire and of the accompanying arms of the infantry is shown by petards which produce colored smoke according to the gun which they are supposed to represent. The effects of the artillery preparation and of the preparation by the infantry mortars of the positions which are to be attacked are likewise represented by the use of petards which are thrown out close to the trenches by the occupants of the trenches themselves.

Third, simple action exercises with real ammunition. When the artillery does not cooperate in them the effects of the artillery preparation are represented by a series of mines which are successively exploded by electrical means. The automatic guns of the enemy, with salute cartridges, are operated mechanically from the trench or observation shelter.

The characterizing feature of shooting and combat instructions in the German army is the employment of real ammunition. The Germans do not begrudge the outlay, for this purpose, of rifle cartridges, hand grenades, mortar shells, artillery projectiles and explosives.

We have had the opportunity to witness several combat exercises—the advance of a company, an attack by an infantry battalion with tanks, the attack of a position with artillery support, the crossing of a river with opposition by the enemy, an assault on a permanent work of fortification. The sense of reality impressed on one is such, the creation of the atmosphere of the field of battle so true to life, that there are moments in which one forgets that it is all make believe and, since there are no spectators in war, one feels the impulse to join in the battle.

The soldier who has repeatedly participated in these exercises, who has already formed a part of an advanced guard patrol, who has taken part in an attack under the protection of tanks or in an assault on a position, already has his reflexes prepared and his nerves adjusted to the atmosphere of the field of battle. The contact with reality will scarcely disturb his mind since the sight of a field of battle is already familiar to him.

The Sommauthe Woods Battle of the 118th Infantry on 23 May

["Das Waldgefecht des Infanterie-Regiments 118 am 23. Mai im Bois de Sommauthe," in *Militärwissenschaftliche Rundschau*, January 1941. Translated from the German and condensed at the Command and General Staff School, Fort Leavenworth, Kansas.]

On 23 May, when the long-looked for order to attack arrived, the 3d Battalion was in position on the line; the 1st and 2d Battalions held in the rear in reserve. The regiment was stationed in a defensive position exposed to active, hostile artillery fire and under the constant threat of tank attacks. (See Sketch No. 1.)

Regimental mission is: On 23 May, at first keeping contact with troops on the east, only, to attack the enemy on the north edge of the Grand Dieulet woods, push on through the Sommauthe woods, in order to take up a defensive position at the south edge of the woods, and to clear them.

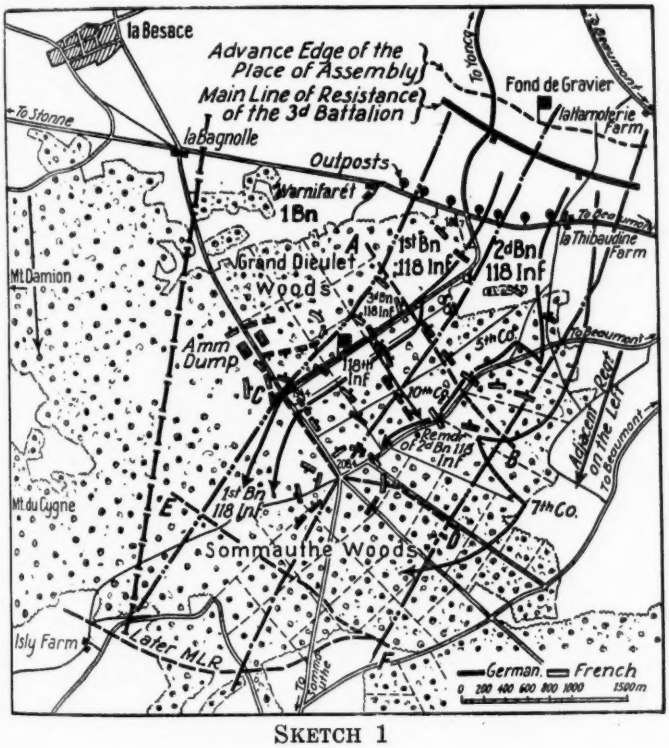
The neighboring division, on the west, at the same time attacks from a position to the south of Besace, and will join the 118th Infantry at the objective—the Isly farm. As flank guard, a battalion out of their own division is employed. However, it follows the 118th Infantry only to the la Besace-Sommauthe road. A pioneer company with flame-throwers is attached to the regiment and the latter is supported by two detachments of heavy and two of light artillery.

After preparations are completed and after a short preparation by artillery fire, the attack of the infantry is to

begin at 5:00 AM on the 23d. The troops are to move forward 300 yards to the line A-B, take this line, and clear out the captured part of the woods. Then, after 8:00 AM, the line C-D is to be taken; and in like manner, E-F. Then they are to go forward to the objective. The time for each of these movements will be announced by the division headquarters during the attack.

The artillery fire is to be massed along the road to Yoncq, at CR 188.7 and at RJ 194.4; and from along the road near the Thibaudine farm to the road intersection at 208.4; then, upon what are presumed to be French support positions near RJ 194.4 and the intersection at 208.4.

Reconnaissance reveals that the enemy is weak at the edge of the woods, but has stronger positions along the line A-B. What lies farther to the rear is not known. Planes are not at our disposal.



SKETCH 1

After a reconnaissance early on 22 May, the regimental attack order assigns two battalions to the line for the attack with the main effort on the right; the 1st Battalion on the right, the 2d on the left. A highway or road is to be followed to indicate direction and to permit placing heavier weapons in the thick forest. On both sides of the roads which they followed, the battalions are to send shock troops into the woods, push past supporting points along the road, surround and then attack them. Supporting points at more remote distances from the roads are to be left alone for the time being.

The 3d Battalion remains in position, but later assembles and follows the 1st Battalion. The heavy weapons are divided between the two battalions, the majority going to the 1st Battalion. There are left behind a light and a heavy platoon of the 13th Company, two platoons of the 14th, one platoon of the pioneer company in regimental reserve.

The regimental staff follows the 1st Battalion.

During the night of 22-23 May, assembly preparations go on unnoticed by the enemy, in and on both sides of the Fond de Gravier: on the right the 1st Battalion, on the left the 2d Battalion, the regimental staff with the front companies and about midway between them. Officers and men listen into the night, eager to fight. The platoon leaders go to give last instructions to their platoons. No rifle fire is to be heard. The enemy artillery sweeps the countryside in intermittent bursts of fire. Some shells land near, some farther away. Suddenly the fire bursts out in roaring succession of forty, fifty or sixty shells in a single spot. A burst lands in our vicinity—dangerous and frightening, but does no harm. For days they have fired on the same spots: the Yoncq road, on our ground (north slope—we are on the south slope) and Thibaudine farm.

At 4:30 AM the leading companies come up to push farther toward the enemy lines. There is no noise. Group leaders watch carefully to see that their line does not become broken. Dawn begins to break.

At 4:42 AM our artillery fire begins. The woods ring with echo. At first the French remain silent. It is five o'clock; our artillery fire moves forward. Shock troops move forward and disappear in the heavy morning fog. From the 1st Battalion only a few rifle shots are heard while two or three French machine guns are hammering away in the direction of the 2d Battalion. In a few moments they are silent. In their place soon is heard the sound of fighting deeper in the woods.

The regimental staff moves forward on the road that had been followed by the 1st Battalion. Along the edge of the forest a heavy burst of fire strikes them. Ten men drop. Using every cover, they penetrate further into the woods.

A primeval thicket! High, ancient trunks, between them an impenetrable mass of shrubs, weeds, thorns and creeping vines. At times one can see but 10 to 15 yards ahead. There is shooting everywhere but the enemy is seldom seen. The shock troops shove, crowd, and plunge ahead through the thicket. Shot from close at hand, many of the reckless fall. Hand grenades fly from every direction and cause losses. Our hand grenades with handles are of but little effect. Bouncing back from the branches, they endanger the throwers or else fly against the wire netting in front of the machine-gun nests, and explode harmlessly on the ground. It is impossible to install heavy weapons in this woods. The men fight with hand weapons almost everywhere. One enemy machine-gun nest after the other falls, but with such reckless use of officers and men the shock troops of even the best companies are soon used up.

Our opponents fight stubbornly, cunningly, until all but surrounded. They seldom surrender. They are negro Senegalese, in their element here, masters of bush warfare. Concealed behind tree roots, artificial or natural foliage screens, they entrench where a path or a more open space attracts the attacker. Shots burst out from close at hand, with nearly every one effective and deadly. Even the riflemen concealed in the trees usually remain unseen. Often they permit the attacker to pass, to finish him from the rear. They harass reserves, messengers, staffs and artillerymen.

The 2d Battalion has taken the nests on the edge of the woods and 60 white prisoners. In the thick fog, however, it has gone beyond the road it was supposed to follow, with its main effort and flank companies. In spite of compasses, the companies are soon lost in the thick woods. The 7th Company, on the left, cleared the line C-D on time in a keen at-

tack but in the course of further fighting, parts of it became separated. When the company sergeant and then the commander finally fall, they are left without a leader. The battalion commander finally succeeds in finding the road through the woods to point 208.4, and in reaching line A-B with parts of the 5th Company, somewhat late, after a costly fight along the way. The heavy weapons are not practical on account of the forest growths which block the road, and finally this detachment halts in front of line C-D. It is no longer possible for them to take the strong and wide line of defense at the road intersection. Artillery can not help. Observation is lacking. Their observer is out of communication with them. The radio does not work in the dense woods. Those 70 or 80 men sit still, therefore, and the enemy begins to encircle them. The battalion commander decides to attack again. A few rounds are fired from two antitank guns in the front line. The little group rushes at the enemy, the battalion commander in the lead. Their losses are heavy, the battalion commander is wounded. They are exhausted. The remainder of the men dig in.

On the right, with the 1st Battalion, it is easy to follow the broad highway. The companies cannot go astray. The artillery is better able to direct its fire here and the battalion takes A-B on schedule. The clearing of the woods, with the help of parts of the 3d Battalion, is difficult. It takes four days' time to finish it completely.

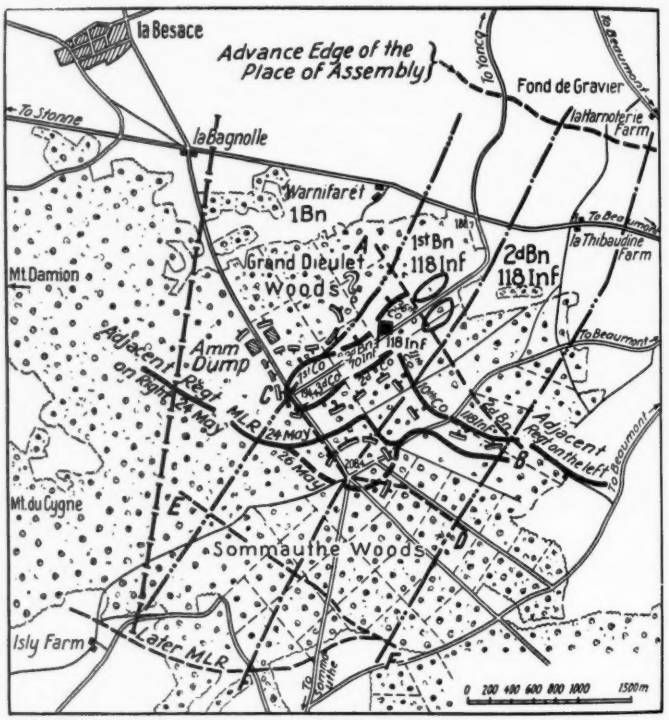
At 7:00 AM the attack moves nearer C-D. The enemy has apparently strengthened his forces somewhat during the hour's pause. Resistance increases noticeably. Nest after nest is taken. Large encirclements are not advisable. The enemy is also off to the side of the road. Companies leaving the highway are soon stopped. Losses among the leaders grow more serious. Line C-D is reached at 10:30 AM, and the heavy guns here along the road pound the points of heavy enemy resistance effectively. Antitank guns, especially, are effective. A light artillery detachment is also an effective auxiliary. When there are not enough heavy guns, the most advanced infantry units are drawn back, the artillery hammers the enemy for a few minutes. Then the attack is resumed.

About 12:30 PM, as mentioned above, the 2d Battalion also reaches line C-D, besides the supporting point at the road intersection, so that the further attack on line E-F is ordered for 2:30 PM.

In spite of heavy losses, the 1st Battalion presses on with unbroken momentum. The enemy resistance ahead appears broken, and becomes noticeably less. The battalion moves forward steadily. On both flanks, however, it has lost contact. On the right there is a break of several kilometers' breadth. The battalion which belongs here is fighting far to the rear and right, somewhere in the woods. Close to the right wing of the regiment near an ammunition dump, is a strong hostile position. An attack against it fails. This position is threateningly close to the flank of the only line of communications to the rear. All our traffic passes over it. Infantry guns and grenade-throwers are going into position. Antitank guns move toward the front as do the staff motorcycles. But the enemy uses machine guns only, and with little effect.

The reinforced 10th Company is ordered to establish connections with the 2d Battalion at the road intersection in front of it. On a side path it soon encounters the enemy. The greater part of the 3d Battalion, which is following the highway behind the 1st Battalion, secures the only connection to the rear. There is shooting on all sides from snipers in the trees and from other enemy troops. At 4:00 PM, the 1st Battalion is approaching the line E-F. It finds no roads here. Forest paths are filled with dense growth. Company and platoon leaders lose direction. They halt, reorganize their troops and send out scouts in all directions.

The regimental commander decides to leave the 2d Battalion where it is, to bring the 3d up on the left beside the 1st, and to push forward to the final objective. With both battalions in a narrow but deep formation and without regard to French defensive positions on the flanks. But in order to do this, the overly long and strongly threatened flanks should be secured. The neighboring unit on the right had just taken Mt. Damion.



SKETCH 2

About 5:00 PM the engineer company was ordered to take the defensive position with a platoon at the road intersection in front of the 2d Battalion. It was to be reinforced by a detachment of infantry shock troops and two of flamethrowers. Heavy guns are brought into position in support; also heavy infantry guns. However, due to poor visibility and lack of accurate knowledge as to the location of the 2d Battalion, the artillery was unable to help. The attack begins at about 6:00 PM. The crews of the heavy guns can see nothing of the defensive positions. They lay their fire where they assume strong points exist. The flame-throwers accomplish nothing in the brush and foliage, but hurry forward toward the unseen enemy. Progress is difficult. Before they are able to use their flame-throwers, both are shot down. And so, in spite of the courage of the engineers in the attack, the operation was broken off, to put an end to mounting losses.

A part of a company of the battalion to the right of the 118th Infantry is fighting to join our wing. However, the supporting position near the ammunition dump is a constant threat and forms no connection with the main part of

the battalion. It is still stationed along the highway to La Besace. It is reported that the enemy near the ammunition dump is being reinforced. At the road intersection at point 208.4, there is much activity.

Preparations for a counterattack with a few tanks are being made astride the highway between the road intersection and La Besace. Antitank guns are quickly in place. The attack is easily stopped. Able-bodied, black Senegalese scouting troops press in from every side along the long flanks of our lines. Grenades thrown by rifles and grenade-throwers explode far in rear of us. Hand grenades hurled by stealthy black fighters burst in our lines and cause uneasiness among our men. We find traces of the enemy everywhere, but meet him nowhere. The dead lie everywhere, white and black. As the day ends it begins to rain.

At 7:30 PM a division order is received: "The regiment is to attack today and hold the positions they gain. For this purpose the 1st Battalion is to retreat as far as the Sommauthe—Besace highway. Contact is to be established with the 2d Battalion." The neighboring division on the right has taken Mt. Damion, and has gone but little beyond there. The unit on the left has advanced about the same as the 2d Battalion.

The defensive positions may still be taken before it is completely dark. The 10th Company's breakthrough to the 2d Battalion is to take place shortly before nightfall. To prevent the nightly activity of the black scouting troops, all grenade-throwers and infantry guns are brought into position and much ammunition is brought up. They are ordered to keep up a devastating fire close in front of their own lines. This battalion protection occasions no difficulties for the 1st Battalion on the highway, or for the 2d Battalion on the forest road, made passable by the engineers. Enemy artillery is active in the rear. From the front they were not able to reach us because of the French nests, and also, probably, due to not knowing our position.

The regiment took over three kilometers of this jungle, filled in its entire depth with defense strong points, against a desperate foe, a master of forest fighting. The breakthrough of the 1st Battalion, now in progress, can not be finished, owing to a lack of reserves.

On 24 May the attack is not resumed, since its main mission is accomplished.

The regiment next assumes a defensive position. The main battle line runs through the center of the forest. The 1st Battalion position is decided on and established without regard to hostile strong points on its right flank. The line of communication of enemy strong points is broken in such a way that the hostile forces occupying the position, about one company, are taken prisoner by the adjoining battalion on the right. Also, the strong defensive position at the road intersection falls into our hands without loss on our part on 25 May, after a shelling by the artillery and the heavy infantry guns.

"Mistakes and even disobedience are better than inertia . . . better a faulty plan which shows boldness and decision than a perfect plan enmeshed in uncertainty."—*Truppenführung.*

"We have only considered leadership by the officers; but what of the noncommissioned officers? The answer is simple. Good officers will produce good N. C. O.s just as good officers and N. C. O.s will produce good men."—*Suggestions for Unit Training* by Major M. P. Huthwaite, British Army.

Academic Notes

Current School Material, Which Affects Instructional Procedure or Tactical Doctrines

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COLONEL M. C. SHALLENBERGER, Infantry, *Assistant Commandant*
COLONEL O. H. SAUNDERS, Infantry, *Class Director*
LIEUTENANT COLONEL D. C. SCHMAHL, Field Artillery, *Secretary*

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G-1 Section, Personnel	LIEUTENANT COLONEL W. A. COPTHORNE, *Chemical Warfare Service*
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Air Support of Ground Troops

BY
LIEUTENANT COLONEL THOMAS F. HICKEY, *Field Artillery*
AND
CAPTAIN RAY W. CLIFTON, *Air Corps*

This article went to press prior to receipt of War Department Training Circular No. 52, dated August 29, 1941, subject: *"Employment of Aviation in Close Support of Ground Troops."*—THE EDITOR.

Much has been said and much more will be written concerning the collapse of the Allied armies in 1940. New weapons, vitamin pills, fifth columns and propaganda have been reported to have had their place in veiling the causes of the debacle which the world witnessed in Norway, Holland, Belgium, France and the Balkans.

Actually, the present war in Europe has brought forth *no* new weapons. But it has brought forth entirely new ideas in the use of the weapons which have been available to all armies since long before 1940. The German "Victory in the West" was due to: the number of these weapons used; the tactical handling of these weapons; the flexibility of their employment; and the coordination and cooperation by the various arms and services. By this combination, the Germans achieved the most sought after advantage in war —*tactical surprise.*

The old Allied concept of a linear defense, such as was used in 1918, and based on the close cooperation of infantry and artillery supported by tanks and aviation, was met by the German concept of modern war—the tank-aviation combat team with infantry and artillery support. When the shallow depth of this linear defense had been punctured, this fast-moving, quick-driving, deep-penetrating team with organic infantry and artillery support moved into the open, and its supporting aviation increased the depth of the fire support furnished by the artillery.

We have laid great stress in our tactical training on the importance of the "combat team." This phrase has been overworked by those who saw something new in its conception. Its present use is nothing more or less than the artillery doctrine of close support for its infantry applied to the other arms when they work in close cooperation with their infantry. *The advent of air units in close support of ground troops is only the introduction of a new arm into the combat team.*

It is believed that everyone will agree with the general principle just stated, but the application of that principle to specific tactical situations will cause discussion. Let us commence by saying that the tactical principles used by the German air force in its close support of ground troops were the same as have been taught at our service schools for many years.

Modern war envisages one of two general situations. The first is a quick moving situation where time and space factors are relatively large and control is somewhat decentralized. In this situation highly mobile mechanized and motorized forces supported by combat aviation will bear the brunt of the action. Thorough advance planning, a high degree of flexibility, rapid and aggressive execution, and decentralization of control will all be emphasized. The other situation occurs after air power, mechanized forces, and ground troops have slowed down the "blitzkrieg" and the movement of opposing forces becomes limited for considerable periods of time. In the latter case, the old infantry-artillery team supported by mechanized forces and combat aviation again comes into the picture. Here detailed plans, thorough execution, and close coordination and cooperation will be of most importance.

Regardless of the general situation, the following principles are believed to apply to air force in support of ground troops:

a. Command of the air is essential.—Air advantage in the critical area is necessary if the maximum air effort is to be used in close support missions. Otherwise, some of the air support or air combat command must be used against the hostile air force. This air advantage will generally be secured in an area by pursuit attacking hostile aircraft in the air and bombardment attacking the hostile aviation on the ground.

b. Air force in direct support of ground troops operates solely to further the ground mission.—This is done by attacking such hostile personnel and material objectives as have a direct influence on the success or failure of the ground mission.

c. Unity of command is essential.—The air force when supporting ground troops is used in the same way all other arms are used—to assist the infantry in accomplishing its mission with a minimum of losses. In order to get the maximum use out of this important arm it is necessary that the air force commander be familiar with the powers and limitations of the ground means. But, more important, the ground commander must have a thorough knowledge of the powers and limitations of the supporting air force. Certain characteristics peculiar to that branch must be kept constantly in mind. Some of these are as follows:

(1) The entire available air force can be concentrated over any space of the front in a short period of time.

(2) It is essentially a weapon of surprise to be used for immediate effect.

(3) Its firepower does not replace that of the ground troops. It should not be used on targets within the range of ground weapons unless ground weapons are not available or are unsuitable. It should, however, be used to increase the range of continuous supporting fire for the ground forces because it can operate at greater distances than artillery.

(4) Losses will be comparatively large and economy in the use of the available air force will always be necessary.

(5) Air support on a particular target is not a certainty. The mission may be interfered with by weather, lack of visibility, enemy action, mechanical failure or other causes.

(6) The interval between a request for support and the time that air support is given will vary with the situation; the length of the interval depending upon the distance the air bases are located from the front and whether or not the supporting aviation is air or ground alerted.

(7) In estimating the total firepower and volume of fire which can be obtained from the supporting aviation, the commander cannot estimate as he would for that received from supporting artillery. He can count only the power of the first attack because the number and power of subsequent missions will vary due to the time and space factors involved in flying time to the bases, reloading and reservicing of the aircraft and due to the probable losses of airplanes.

(8) When air support is furnished it must be adequate.

(9) Like artillery, control of the air support should normally be centralized.

(10) Air support is extremely flexible.

In support of the principles enunciated above, the following illustrative problem, it is believed, will bring out the points emphasized and give one solution to the correct tactical handling of air force in direct support of ground troops.

Illustrative Problem

1. GENERAL SITUATION.—*a.* The I Army Corps, reinforced, after concentrating in the Carlisle—Harrisburg area moved south, and, on 9 January, gained contact with a hostile force along the general line shown on Map A.

b. At about 4:00 PM, 9 January, the Army Corps commander received the following message from the Army Commander:

> "Red force confronting you in the area: South Mountain—Susquehanna River—Potomac River is estimated as a corps of two infantry divisions with attached cavalry. Red armored force, estimated as one division is south of the Potomac. Destroy the Red force at once and seize Baltimore. Air Task Force is available to you on 10 and 11 January. Air Task Force commander will report to you today."

2. SPECIAL SITUATION.—*a.* At 6:30 PM, 9 January, the Air Task Force commander arrived at the CP I Army Corps for a conference with the Army Corps commander and members of his general staff.

b. The ground commander after greeting the air support commander, called in his staff, and had them present a picture of the ground situation. The corps G-2 covered the enemy situation and capabilities, his probable intentions, and an estimate of the terrain from the standpoint of Red. G-3 covered the plan for the employment of the ground troops on 10 January and gave an estimate of the terrain from the Blue viewpoint.

c. The Air Task Force commander stated that his unit consisted of 4 groups of light bombardment aviation; 2 groups of medium bombardment aviation; and 3 squadrons of reconnaissance aviation. Each group consisted of 3 squadrons.

d. The ground commander then explained his tentative plan for the employment of the ground troops on 10 and 11 January. He discussed with the air force commander, the time and place the air support would become available and other necessary data concerning the Air Task Force. He emphasized the importance of the supporting aviation giving maximum air support on 11 January in support of the corps main attack. He also directed that chemicals not be used. Finally, the ground commander issued a directive for the employment of the supporting aviation, important extracts of which are as follows:

"Attack on Red Armored Division south of the Potomac, when and if located, to have first priority at all times.

"Priorities on 10 January, in order of importance, to be: bridges across the Potomac River; ground installations of hostile observation aviation; road and rail installations north of Baltimore and in the vicinity of Frederick Junction; command and supply installations in the vicinity of Westminster.

"Priority on 11 January to be continuous support of the corps attack.

"The detailed planning for this continuous support to be worked out by both staffs in full cooperation, as the situation clarifies."

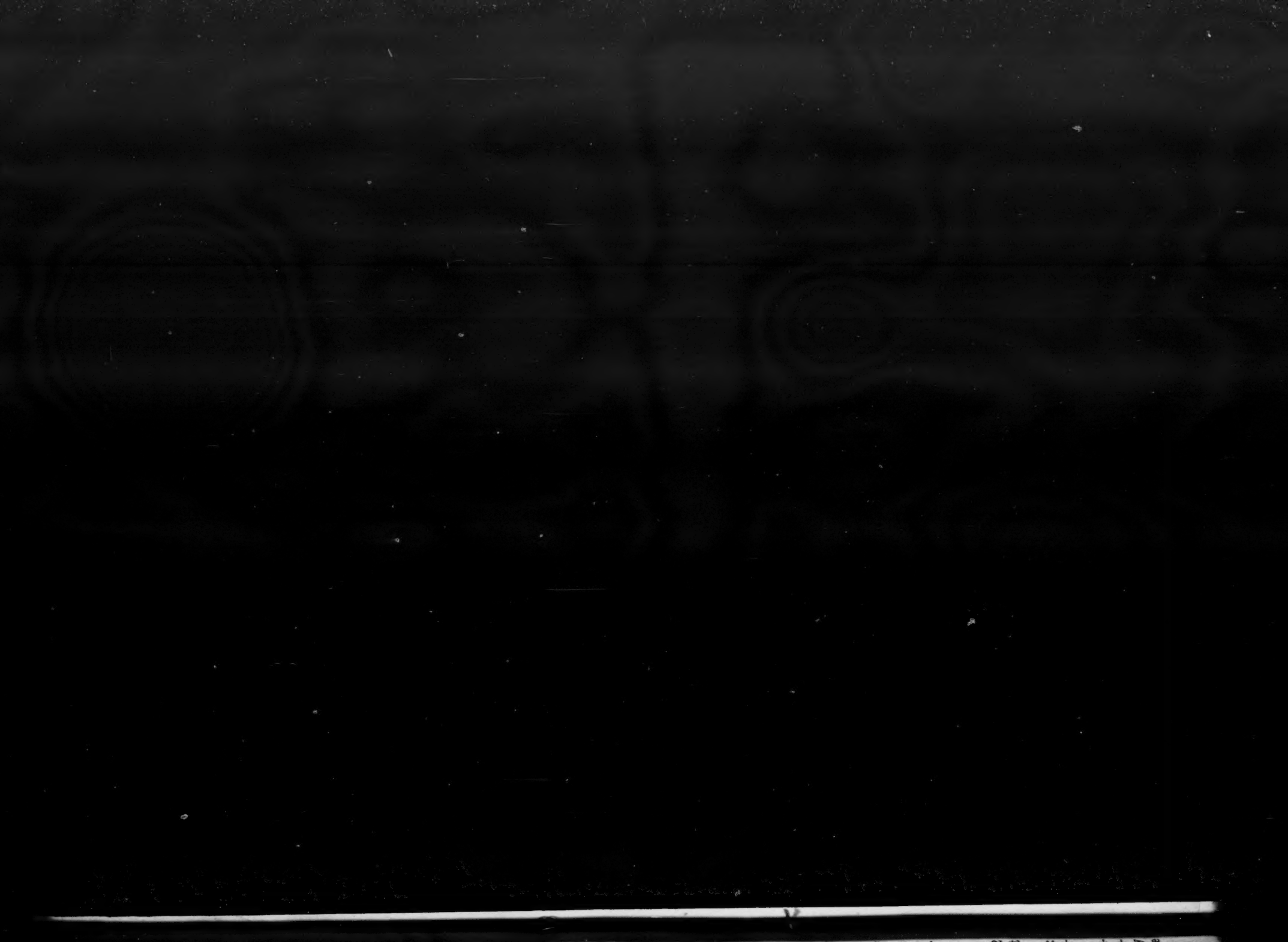
e. The Air Task Force commander made arrangements for his staff to visit the members of the corps staff on 10 January.

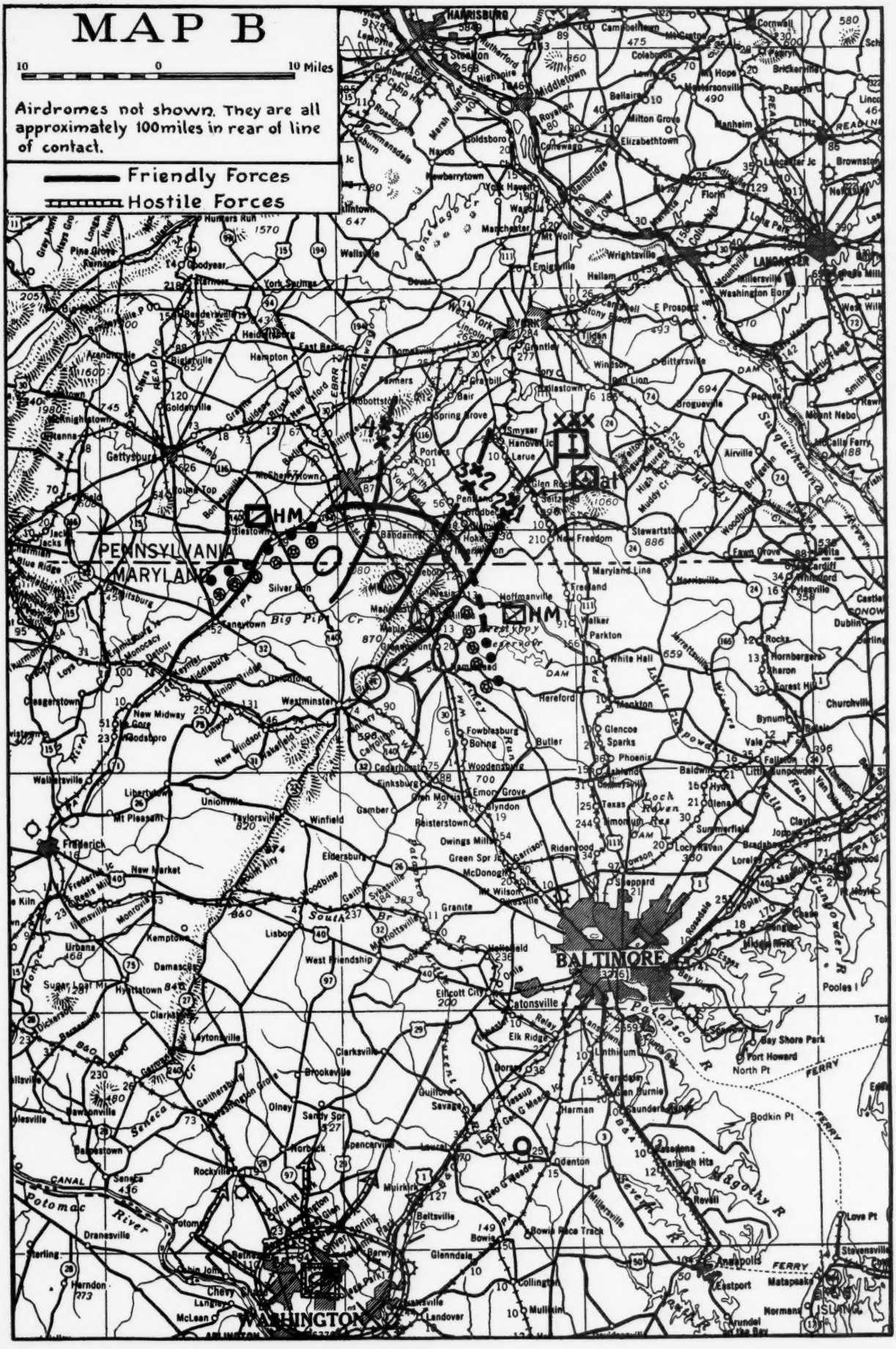
3. SPECIAL SITUATION (CONTINUED).—*a.* The elements of the I Army Corps developed the hostile situation on the front of the corps during the morning of 10 January.

b. During this period, the Air Task Force attacked targets mentioned in paragraph 2 *d*, above.

c. By 2:15 PM, 10 January, the situation along the corps front had clarified sufficiently for the corps commander to issue orders for the employment of the corps on 11 January. Extracts of the corps order are as follows: (See Map B.)

> "Situation: See Map A.
>
> I Corps, reinf, attacks 6:30 AM, 11 Jan, envelops hostile right (east) flank and captures Mexico—Cranberry ridge.
>
> 1st Div.
>
> Atchd * * *
>
> Move after dark to vicinity of PIERCEVILLE. Attack and capture high ground in vicinity of MANCHESTER and corps objective within its zone.
>
> 2d Div.
>
> Capture high ground E of WENTZ. Assist advance of 1st Div.
>
> 3d Div.
>
> Main effort on W flank. Assist advance of 2d Div.
>
> 4th Div.
>
> Capture high ground S of RAUBENSTINE.
>
> Field Arty.
>
> Divs: 2d Div prepared to reach line: CR 792 (385-732)—RJ 655 (388-736) with 1 med and 2 light battalions.
>
> Corps: Prepared to mass fires in the area: CR 792 (385-732)—CR 937 (387-733)—RJ 712 (385-735).
>
> Air Task Force: support Corps attack by attacking targets beyond artillery range, preventing movement of hostile reserves to E flank, and attacking any hostile armored force moving toward the front of the Corps.




MAP B
10 0 10 Miles
Airdromes not shown. They are all approximately 100 miles in rear of line of contact.
Friendly Forces
Hostile Forces
HARRISBURG
LANCASTER
PENNSYLVANIA
MARYLAND
HM
HM
XXX
BALTIMORE
WASHINGTON
Potomac River
Big Pipe Cr
Patapsco R
Gunpowder R
Bodkin Pt
North Pt
Love Pt
Annapolis
Eastport
Matapeake
Pooles I
Gay Shore Park
Fort Howard
Sparrows Point
Glen Burnie
Catonsville
Ellicott City
Laurel
Bowie Race Track
Collington
Mullikin
Glenndale
Landover
Beltsville
Odenton
Harman
Jessup
Guilford
Savage
Clarksville
Brookeville
Olney
Sandy Spr
Norbeck
Rockville
Spencerville
Damascus
Kemptown
Urbana
Lisbon
West Friendship
Woodbine
Eldersburg
Winfield
Taylorsville
Mt Pleasant
Unionville
Libertytown
Frederick
New Market
Gaithersburg
Germantown
Boyds
Dranesville
Herndon
Chevy Chase
McLean
Arlington
Alexandria
Fairfax
Falls Church
Annandale
Springfield
Hyattstown
Sugar Loaf Mt
Clarksburg
Leytonsville
Damascus
Sykesville
Mt Airy
Woodbine
Union Bridge
Middleburg
Taneytown
Emmitsburg
Thurmont
Westminster
New Midway
Woodsboro
Union Mills
New Windsor
Manchester
Hampstead
Finksburg
Cockeysville
Timonium
Lutherville
Towson
Loch Raven
Phoenix
Glencoe
Sparks
Texas
Hereford
Parkton
White Hall
Monkton
Freeland
Maryland Line
Hoffmanville
Stewartstown
New Freedom
Glen Rock
Seitzland
Pennsylvania
Broadbent
Hokes
Bandanna
Hanover Jct
Larue
Spring Grove
Bair
Penners
Thomasville
Dover
Manchester
Wellsville
Emigsville
Hallam
Wrightsville
Columbia
Marietta
Mount Joy
Elizabethtown
Milton Grove
Mount Hope
Hershey
Palmyra
Annville
Lebanon
Cornwall
Colebrook
Campbelltown
Middletown
Royalton
Highspire
Steelton
Swatara
Hummelstown
Grantville
Hershey
Palmyra
Annville
Lebanon
Cornwall
Colebrook
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Hershey
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d. During the afternoon, 10 January, the members of the Air Task Force staff conferred with their colleagues of the corps staff. The following is a summary of these conferences:

(1) *Corps G-2—Air S-2.*

(a) Prepared a coordinated plan for the use of the Air Task Force reconnaissance unit and the Corps Observation Aviation.

(b) Planned for interchange of hostile information between the air and ground units to include the furnishing of air photos of vital installations now in the hands of the ground force, to the air unit.

(c) Planned for a member of the G-2 ground force to be at the Air Task Force Reconnaissance unit airdrome to interview pilots on their return from missions.

(2) *Corps G-3—Air S-3.*

(a) Discussed the plan of attack of the corps for 11 January with particular emphasis on the capability of the Red Armored Division to operate on the east flank of the corps by daybreak 11 January.

(b) Discussed the plan for continuous air support over the main effort of the corps on 11 January and decided that it would be furnished as follows:

(1) Three squadrons of light bombardment to attack individually at 6:30 AM, 11 January, all hostile reserves previously located, hostile command and supply installations, and such normal artillery targets AS CAN NOT BE FIRED UPON BY THE AVAILABLE ARTILLERY with the corps.

(2) Commencing at 6:45 AM, and at fifteen minute intervals thereafter a flight of six light bombardment planes to furnish continuous support for the ground attack, with particular attention to the front of the 1st Division, by attacking targets previously designated, or targets of opportunity.

(3) Planes attacking at 6:30 AM to use light fragmentation bombs. On return to the airdrome these squadrons to reload with 100-lb. demolition bombs and remain on "ground alert" in reserve. The remainder of the light bombardment aviation furnishing continuous support to use light fragmentation bombs continuously.

(4) Three medium bombardment squadrons loaded with 100-lb. demolition bombs to attack at dawn, 11 January, hostile air installations on the ground, concentrating especially on the installations of the hostile observation aviation. On return to airdrome, reload with same size bombs, remain on "ground alert" in reserve. Repeat attack at 10:00 AM unless ordered otherwise.

(5) Of the remaining medium bombardment squadrons, two to be loaded with 100-lb. demolitions bombs and one with 1,100-lb. demolition bombs. These squadrons to remain on "ground alert" in reserve except that they would be at "stations" from 6:15 AM to 6:45 AM for the purpose of attacking the Red Armored Division if it is located on our front at daybreak 11 January.

(6) The three reconnaissance squadrons to be used for reconnaissance missions in front of the Corps to search for targets suitable for combat aviation and for reconnaissance of the Washington area, continuously watching for the Red Armored Force reported somewhere in that vicinity.

(c) Discussed the plan for control of the Air Task Force and decided that the Assistant S-3 Air Task Force with a mobile radio would set up an air control station at the Corps CP. Corps would furnish three telephone circuits from the "control" to Air Task Force CP at Middletown. All requests for air support were to go from the ground force, through "control" to the Air Task Force CP. However in an emergency requiring immediate air support, orders for this support would be given direct to the flight comander in the air from "control."

(d) Discussed the possibility of having reconnaissance aviation mark targets for the Air Task Force by dropping parachute smoke bombs.

(e) Discussed the details in the corps plan of Signal Operating Instructions, of interest to the Air Task Force, especially calls for marking front lines, and displaying of the regulation panels by leading elements of ground troops when called for by the air.

(f) Discussed the use of liaison officers and decided that none, other than the one at control, was necessary. If air support was to be decentralized to the 1st Division at any time, the control with mobile radio could move to that division CP and an additional air liaison officer would then be sent to corps CP.

(g) Discussed the need for pursuit protection for the bridges at Harrisburg for the movement of the 1st Division to attack positions; and for general denial of hostile observation on the front of the corps. The Air S-3 explained that pursuit protection would be furnished by the First Air Force.

(3) *Corps G-4—Air S-4.*—Discussed the supply problem and decided that the Air Task Force was self-sufficient so far as technical aid from the ground establishments was concerned.

4. SPECIAL SITUATION (CONTINUED).—*a.* The I Army Corps attacked at 6:30 AM 11 January and the attack progressed according to plan.

b. The Air Task Force furnished continuous support for the ground attack.

c. At 8:40 AM, air reconnaissance reported a Red armored force moving north out of Washington in four columns; heads of columns as shown on Map B.

d. The Corps Commander directed that this force be attacked with all available air force.

e. The Air Task Force complied as follows:

(1) "Control" sent the ground commander's order by telephone to the Air Task Force CP and then ordered the two flights which were in the air at this time to attack without delay. These planes in the air had the light fragmentation bomb and they attacked the half-track vehicles and motor trucks.

(2) The three medium bombardment squadrons in reserve (two armed with 100-lb. demolition bombs and one with 1,100-lb. demolition bombs) attacked without delay. The squadron with 1,100-lb. bombs attacked the bridges over the Patapsco. The other two squadrons attacked the heads of the columns and concentrated on the tanks.

(3) The remaining three medium bombardment squadrons took off to attack as soon as reloaded and reserviced.

(4) The remainder of the light bombardment which had not flown a mission that morning attacked the armored

force without delay.

5. DISCUSSION.—*a.* This problem illustrates a situation in which an independent corps is given an offensive mission and has an air task force assigned to it to assist the ground troops in accomplishing its mission.

b. The method of air support was planned for the following reasons:

(1) It was necessary to have a definite force in reserve to attack the Red Armored Division at daybreak or any time thereafter. This armored force was the major threat to the success of the ground operations.

(2) It was necessary to attack the hostile air installations immediately in front of the ground forces, especially installations of the hostile observation aviation, in order to further the ground effort.

(3) It was necessary to have continuous air support over the front of the main effort because, prior to the attack, the situation was obscure. Initially, the 1st Division could expect little resistance, but, as the weight and direction of our main effort became known to Red we could expect him to move reserves to block our attack. At this time we could not plan a definite time table for air attack on definite targets on the following morning. In order to have this attack go through as planned, and give air support to the Corps with the minimum of delay, we placed our air support over the main effort on a time interval basis and the targets to be engaged were to be those designated by the air task force commander before the flight left the ground if information on them was available, those designated by the air or ground commander after the flight left the ground, or in the absence of designated targets, those targets of opportunity selected by the flight commander while over the corps front.

(c) Normally the Air Force would conduct counter-air-force operations by attacking enemy aircraft in the air by pursuit aviation and enemy air installations on the ground by bombardment aviation. However, in this particular situation, three medium bombardment squadrons of the Air Task Force were used to attack the air installations on the ground paying particular attention to the known installations of the enemy observation aviation because this action was sure to restrict the enemy observation activities which activity is of great concern to the ground commander.

(d) It will be noted that eighteen squadrons of light and medium bombardment aviation are used to support this particular ground effort. This is a large number of planes; however, this number is based on *what is needed,* not *what is available.* If the situation requires eighteen squadrons to support the ground action nothing less will suffice.

(e) The big bottleneck in furnishing effective air support is the time lag between the time support is requested by the ground commander and when it is actually delivered by the Air Task Force. In this particular situation this time lag was reduced to an absolute minimum by furnishing continuous air support over the main effort of the corps. This method of support will cause a comparatively large loss of planes and pilots but we must expect to take those losses when it is necessary to obtain maximum air support for the ground effort.

(f) In this situation a flight of six planes is used to furnish continuous support rather than a complete tactical unit—the squadron. This is done because six planes are sufficient to furnish the air support which we anticipate will be needed. To use a larger flight in this situation would be a waste of aviation. Had we been operating on a wider front more planes per flight would be necessary.

(g) It will be noted that the Air Task Force is prepared to support the ground effort by using three different sized bombs. The light fragmentation bomb is available for use against personnel and light materiel targets. The 100-pound demolition bomb is available for use against heavily armored vehicles, tanks, air installations on the ground, and command and supply installations. The 1,100-pound demolition bomb is available for use to destroy the many bridges over streams which cross important roads in this area of operations.

In conclusion, we emphasize the fact that the solution which we have given is one which we believe to be the best for this particular situation. The method of air support will vary with each situation. It must, however, be based on the principle that *sufficient* air force must be made available and not that available air force will have to be sufficient. The subject of *Air Support for Ground Forces* is a broad one and one which will require considerable amount of study and practical experience in the field. But whatever the ultimate answer is to the method of air support, there is one thing certain—*powerful coordinated air support is essential to an army fighting in a modern war.*

"One serious deficiency, which imposed a harder task on our splendid infantrymen and subjected them to the certainty of additional losses, but which, however, could not be remedied, was the lack of tanks, only eighteen being available instead of several hundred which were sorely needed."—

Taken from a description of the last phase of the Meuse-Argonne operations in *"My Experiences in the World War"* by General John J. Pershing.

Library Bulletin

BOOKS ADDED TO THE LIBRARY SINCE JUNE 1941

Abend, Hallett. — **Japan unmasked.** 1941 [M 952-A]

Aglion, Raoul. — **War in the desert.** The battle for Africa. 1941 [M 9405-J.6]

Aircraft Year Book for 1941. 1941 [M 603]

Alexander, Fred. — **Australia and the United States.** 1941 [327.73 (.94)]

American Academy of Political and Social Science:

Children in a depression decade. A survey of the factors affecting children from 1930 to 1940, showing the present status of child welfare. (The Annals, November 1940). 1940 [362.7]

Marketing in our American economy. (The Annals, May 1940). 1940 [380.12]

Mexico today. A general picture of the objectives and the achievements of our southern neighbor. (The Annals, March 1940). 1940 [972-A]

New horizons in radio. Problems and progress of sound broadcasting and future developments in the radio field. (The Annals, January 1941). 1941 [384.5]

Our foreign commerce in peace and war. An account of the status and the characteristics of United States foreign commerce, looking to the future. (The Annals, September 1940). 1940 [382]

When war ends. A consideration of the conditions necessary to bring about a lasting peace. (The Annals, July 1940). 1940 [M 004-A]

American Dietetic Association. — **Quantity food service recipes.** 1940 [641]

American Year Book, 1940. A record of events and progress year 1940. 1941 [973.91]

Andrews, Lt.Col. Lincoln C. — **Military manpower.** Psychology as applied to the training of men and the increase of their effectiveness. 1921 [M 501-G3.73]

Archivist of the United States. — **Sixth annual report of the Archivist of the United States for the fiscal year ending June 30, 1940.** 1941 [027.573]

Bacon, Admiral Sir Reginald & McMurtrie, Francis E. — **Modern naval strategy.** 1940 [M 8501-D]

Baldwin, Ganson J. — **Legal effects of military service under the Soldiers and Sailors' Civil Relief Act of 1940.** 1940 [M 207-C.73-H]

Baldwin, Hanson W. — **United we stand!** Defense of the Western Hemisphere. 1941 [M 103-C.73]

Banse, Ewald. — **Germany prepares for war.** A Nazi theory of "National Defense." 1941 [M 9405-E4-E.43-A]

Beard, Charles A. & Bagley, William C. — **The history of the American people.** 1928 [973-A]

Bidwell, Percy W. — **Economic defense of Latin America.** 1941 [980.0]

Bogen, Emil. — **What about alcohol?** An illustrated outline of scientific facts about alcohol and alcohol drinking. 1939 [178.1]

Brodie, Bernard. — **Sea power in the machine age.** 1941 [M 8501-H.42]

Bunkley, Captain J.W. — **Military and naval recognition book.** A handbook on the organization, insignia of rank of the world's armed forces, etiquette and customs of the American services. 1941 [M 104-B3]

Cammaerts, Emile. — **The situation of Belgium: September 1939 — January 1941.** 1941 [M 9405-J.44]

Canby, Henry S. — **The Brandywine (River of America Series).** 1941 [974.8]

Christowe, Stoyan. — **The Lion of Yanina.** A narrative based on the life of Ali Pasha, Despot of Epirus. 1941 [938-B92 (AL)]

Churchill, Winston S. — **Blood, sweat and tears.** 1941 [M 9405-E3-D.42]

Collins, Alan C. — **The story of America in pictures.** 1940 [973-A]

Commerce, Department of. — **Statistical abstract of the United States.** 1941 [310]

Congress. — **Official Congressional directory for the use of the United States Congress, 77th Congress, 1st Session beginning January 3, 1941.** 1941 [328.736]

Corle, Edwin. — **Desert country.** 1941 [979]

Court of Claims. — **Cases decided in the Court of Claims of the United States October 7, 1940 to March 2, 1941, with report of decisions of the Supreme Court of Claims cases.** Vol. XCII. 1941 [345.41]

Cronin, A.J. — **The keys of the kingdom.** 1941 [813]

Current Biography. Who's who and why, 1940. Edited by Maxine Block. 1940 [920]

Edwards, Frank S. — **A campaign in New Mexico with Colonel Doniphan.** 1847 [M 97362-J3-E5]

Ellsberg, Commander Edward. — **Captain Paul.** 1940 [M 9733-B3-F]

Erickson, Curtis L. — **The army in review.** 1941 [M 203-C.73]

Federal Reporter, Second Series. Vol. 117 F. 2d. 1941 [345.41]

Federal Supplement. Vol. 36 and Vol. 37. 1941 [345.41]

Feldstead, S. Theodore. — **Intelligence.** An indictment of a colossal failure. 1941 [M 9405-H5-E]

Fischer, Louis. — **Men and politics.** An autobiography. 1941 [940.5]

Gayn, Mark J. — **The fight for the Pacific.** 1941 [M 950]

Griffith, G.W.E. — **My 96 years in the Great West; Indiana, Kansas and California.** 1929 [978]

Grow, Lt. Col. Malcolm C. & Armstrong, Captain Harry G. — **Fit to fly.** A medical handbook for fliers. 1941 [M 421-A1]

Gruber, Ruth. — **I went to the Soviet Arctic.** 1939 [947-B92 (GR)]

Hafen, LeRoy R. — **Colorado gold rush.** Contemporary letters and reports 1858-1859. (Southwest Historical Series, Vol. X). 1941 [M 973-C]

Harriman, Florence Jaffray. — **Mission to the north.** 1941 [948.1]

Hawthorne, Hildegarde. — **Williamsburg, old and new.** 1941 [975.5]

Hay, Thomas R. & Werner, M.R. — **The Admirable Trumpeter.** A biography of General James Wilkinson. 1941 [M 973-B92 (WI)]

Hearnshaw, F.J.C. — **Germany, the aggressor throughout the ages.** 1941 [M 943-A]

Herring, Hubert. — **Good neighbors: Argentina, Brazil, Chile and seventeen other countries.** 1941 [980]

Hicks, Major James E. — **Nathan Starr, U.S. sword and arms maker.** 1940 [M 614-F1.73]

Hicks, John D. — **The United States.** Vol. I: The Federal Union. A history of the United States to 1865; Vol. II: The American nation. A history of the United States from 1865 to the present. 1941 [973-A]

Horn, Florence. — **Orphans of the Pacific: The Philippines.** 1941 [991.4]

Hough, Frank O. — **The neutral ground.** 1941 [M 9733-B3F]

Hunt, Ernest H. — **How to win the war of nerves.** 1941 [M 9405-H1-G]

Hutchinson's pictorial history of the war. A complete and authentic record in text and pictures. Vol. II: 2nd October to 26th November 1940. 1941 [M 9405-E3-D.42]

Jackson, John H. & Lee, Kerry. — **Problems of modern Europe.** The facts at a glance. 1941 [940.5]

Jane's All the World's Aircraft, 1940. 1941 [M 603]

Jane's Fighting Ships, 1940. 1941 [M 8205-A1.42]

Jarvis, Major C.S. — **Three deserts.** 1937 [962]

John, Marius. — **Philippine saga.** 1940 [919.14]

Johnson, General Hugh S. — **Hell-bent for war.** 1941 [M 9405-C3-C.73]

Johnstone, William C. — **The United States and Japan's new order.** 1941 [327.73 (.52)]

Jones, Clarence F. & Darkenwald, Gordon G. — **Economic geography.** 1941 [910]

Jones, Paul A. — **Coronado and Quivira.** 1937 [917.80]

Kaye, James R. — **Historical fiction, chronologically and historically related.** 1941 [M 904-C.73]

Kerr, Alfred. — **The art of guerilla fighting and patrol.** A manual of infantry defensive training. 1940 [M 404-J2-C]

Knight, Eric. — **This above all.** 1941 [M 9405-B3F]

Koestler, Arthur. — **Darkness at noon.** (Translated by Daphne Hardy). 1941 [813]

Langsam, Walter C. — **Since 1939.** A narrative of war. Supplement to: The world since 1914. 1941 [M 9405-E3-C.73]

Lapie, Capitaine Pierre O. — **With the Foreign Legion at Narvik.** (Translated by Anthony Merryn.) 1941 [M 9405-B4.44]

Leech, Margaret. — **Reveille in Washington, 1860-1865.** 1941 [975.3]

Lengyel, Emil. — **Turkey.** 1941 [956]

Lewis, Charles L. — **David Glasgow Farragut, Admiral in the making.** 1941 [M 9737-L4-C.73-B92(FA)]

Library of Congress. — **Annual report of the Librarian of Congress for the fiscal year ended June 30, 1940.** 1941 [027.573]

Liddell Hart. — **The current of war.** 1941 [M 9405-E4-D.42]

MacLiesh, Fleming & Reynolds, Cushman. — **Strategy of the Americas.** 1941 [M 103-C.73-A]

Mannin, Ethel. — **Women and the revolution.** 1939 [396]

Markham, R.H. — **The wave of the past.** 1941 [201]

McGillycuddy, Julia B. — **McGillycuddy agent.** A biography of Dr. Valentine T. McGillycuddy. 1941 [970.1]

Miller, Douglas. — **You can't do business with Hitler.** 1941 [M 9405-E3-C.73]

New International Year Book. A compendium of the world's progress for the year 1940. 1941 [031]

Ormont, Jules. — **Straight from the shoulder.** Wit, wisdom and philosophies of today's great men and women. 1939 [803]

Peck, James L.H. — **So you're going to fly.** 1941 [M 409-J1-A.73]

Pemberton-Billing, Noel. — **Defence against the night bomber.** 1941 [M 503-C6]

Perkins, Dexter. — **Hands off.** A history of the Monroe Doctrine. 1941 [327.73 (C)]

Prentiss, Lt. Col. A.M. — **Civil air defense.** A treatise on the protection of the civil population against air attack. 1941 [M 503-C6]

Prewett, Virginia. — **Reportage on Mexico.** 1941 [972-A]

Pridgen, Tim. — **Tory oath.** 1941 [M 9733-B3F]

Puleston, Captain W.D. — **The armed forces of the Pacific.** A comparison of the military and naval power of the United States and Japan. 1941 [M 103-C.73]

Rand McNally commercial atlas and marketing guide. Seventy-second edition. 1941 [912]

Reithinger, A. — **Why France lost the war.** A biologic and economic survey. 1940 [M 9405-E4-D.44-A]

Remington, Lt.Col. Woodbern E. — **Cross winds of Empire.** 1941 [991]

Rollins, Richard. — **I find treason.** The story of the American anti-Nazi agent. 1941 [M 505-E4]

Roper, Edith & Leiser, Clara. — **Skeleton of justice.** 1941 [943-A]

Scott, F.R. — **Canada and the United States.** 1941 [327.73 (.71)]

Shelton, A.C. — **Newfoundland: Our north door neighbor.** 1941 [971.8]

Shepherd, E. Colston. — **The military aeroplane.** 1941 [M 9405-G9-C.42]

Shirer, William L. — **Berlin diary.** The journal of a foreign correspondent 1934-1941. 1941 [M 9405-B4.73]

State Department. — **Papers relating to the foreign relations of the United States.** The Lansing Papers 1914-1920. Vol. II. [327.73 (A)]

Statesman's Year-Book 1941. Statistical and historical annual of the states of the world for the year 1941. 1941 [310]

"Strategicus." — **Can Britain be invaded?** 1941 [M 9405-E3-D.42]

Streit, Clarence K. — **Union now with Britain.** 1941 [M 9405-E4-C.73-A]

Teale, Edwin W. — **The book of gliders.** 1939 [M 409-A1.73]

Wall, Francis P. & Zeidberg, Louis D. — **Health guides and guards.** 1940 [613]

War Department. — **Military dictionary.** Part I: English-Spanish; Part II; Spanish-English. 1941 [M 202-R.73.46]

Ward, Robert D. — **The climates of the United States.** 1925 [551.5]

Waterfield, Gordon. — **What happened to France.** 1940 [M 9405-E4-D.44-C]

Waterman, Joseph M. — **With sword and lancet.** The life of General Hugh Mercer. 1941 [M 9733-E4-C.73-B92 (ME)]

Wavell, General Sir Archibald. — **Generals and generalship.** The Lees Knowles lectures delivered at Trinity College, Cambridge, in 1939. 1941 [M 501-G5.42]

Wheeler-Nicholson, Major Malcolm. — **America can win.** 1941 [M 9405-E4-C.73-A]

Wilgus, A. Curtis. — **The development of Hispanic America.** 1941 [980.0]

Wilson, Charles Morrow. — **Central America: Challenge and opportunity.** 1941 [972.8]

Young, Pauline V. — **Social case work in national defense.** A cultural approach to the problems of enlisted men and their families. 1941 [361.8]

BOOK REVIEWS

THE ARMY IN REVIEW

By Curtis Erickson

210 pages . . . New York: E. P. Dutton & Co., Inc.

"The Army in Review" is a good survey of our present-day military forces, covering the ground thoroughly both by word and illustration. It differs from similar surveys in a novel and entertaining way. Instead of attempting to picture the modern army by means of simple literary exposition and description, Mr. Erickson's book proceeds to do so through the expedient of dialogue and narrative. Two youngsters, Tom and Jerry, under the urge of natural curiosity and the necessity of performing an assignment for their civics class at school, apply to the Commandant of the Fort to obtain information about the army. The Commandant assigns the precocious Lieutenant Harris to take the boys around on a week's tour and explain everything to them. They see everything from tanks to bakeries, and, in informal conversation, the mythical subaltern describes the whole setup from the act of enlistment to the receiving of medals and decorations.

There is ease and humor, and a really engaging charm in this method of presenting the material. "The Army in Review"—although, like other works along survey lines—has little to offer the trained military man—will, and should, attract many civilian readers for whom volumes less fresh and sprightly might lack appeal. It has genuine worth, too, for younger officers, for trainees and for all who are making their initial approach to an understanding of the army, its organization, methods and equipment.

STRATEGY OF THE AMERICAS

By MacLeish and Reynolds

247 pages . . . New York: Duell, Sloan and Pearce

Submitted herein is a brief and intelligible estimate of the defensive problem involved in securing the Western Hemisphere against any power or combination of powers, together with a description of the armed forces whose job it would be to do it. Even estimating a military situation, of course, makes for a certain amount of intellectual partisanship, and the authors are vigorous proponents of the view that the United States and the Latin American countries should join in making the western world a fortress impregnable to foreign attack—that the Hemispheric Position be consolidated in preference either to the United States' undertaking actual operations abroad or withdrawing into the shell of its own immediate territorial confines.

As general reading on the fundamental strategic problem, as a source of interesting facts and interpretations, "Strategy of the Americas" will be found to justify attention.

SEA POWER IN THE MACHINE AGE

By Bernard Brodie

466 pages . . . Princeton: Princeton University Press

This volume tells how naval tactics and strategy as well as international relations and foreign policies have been influenced by inventions and changes pertaining to ships or affecting naval warfare: the change from sail to steam, from wood to iron and iron to steel, the introduction of armor and improvements in armament, the appearance of the submarine and airship. It is interesting, instructive and readable; somewhat lengthy, however—one feels that the author could have said what he has to say in half the number of words he uses. Judging from the numerous references, the book has a solid foundation of research.

BATTLE FOR THE WORLD

The Strategy and Diplomacy of the Second World War

By Max Werner

403 pages . . . New York: Modern Age Books

Unlike so much contemporary writing about the war, which makes an emotional appeal for American support of Britain, this book presents an impartial interpretation of events as they have occurred in the war up to the spring of 1941, and a logical statement of the odds facing American foreign policy.

The concept of total war, so alien to the traditional American military philosophy, is illustrated. But the author does not stop with a record of the successive campaigns. Not only does he point out in each case what might have been done to change the course of events; he looks behind the military operations and analyzes the underlying political and economic considerations on both sides. Naturally, such a discussion must be carefully documented. Mr. Werner's predictions with regard to German-Soviet relations have already been borne out. It will be even more interesting to see whether the remainder of his observations also fall within the realm of sound prophecy.

ORPHANS OF THE PACIFIC

The Philippines

By Florence Horn

316 pages . . . New York: Reynal & Hitchcock

"There are some 16,000,000 Filipinos on this earth who are ashamed of their past, bewildered by their present, uncertain of their future." This is the opening note of Florence Horn's *Orphans of the Pacific.*

Clamoring for independence, says the author, the people of the islands are not so sure that this is what they really want. What will be the price of this long-sought-for freedom? Will the islands reach national maturity only to fall victim to the threat which now, and for some years past, has beset them?

The heterogeneous population of the Philippines, Miss Horn believes, does not furnish a very fertile ground for the building of a national structure. With wide divergencies in political and religious beliefs the people are further separated by the difference in languages. In addition to English, Spanish, Japanese and Chinese, there are 87 Philippine dialects spoken. She says there are rival artistocracies, the American and the Spanish, and curiously patterned social gradations from the shop-keeping Chinese, who are also the money lenders, the Japanese, who control the hemp industry and deep sea fishing, down to the poor who are continuously

in debt here as elsewhere. Readers may disagree with the idea that such divergencies necessarily preclude national unity.

Most of the exports now go to the United States, but after 1946, if the Philippines receive their independence, tariffs will be levied and then it seems probable that the principal market for their products will be Asia.

The most important problem, in the author's opinion, remains: Do we want the Philippines or are we willing to see them assimilated into another nation? Eventually, she warns, that problem will have to be decided, not just for a few brief decades, but on a more permanent basis.

TURKEY

BY EMIL LENGYEL

450 pages . . . New York: Random House

"Whoever" said Napoleon, "is master of Constantinople is master of the world." When in times gone by Turkey, as a nation, waxed powerful and acquisitive, she went far along the way toward proving the truth of the Napoleonic dictum. Today a recrudescent Turkey, still mistress of the historic straits, is necessarily in the forefront of world politics and diplomacy.

Many readers will be happy to consult this new history of Turkey by Emil Lengyel. It covers the essential elements of the subject well, and, being a popularization rather than a text, is designed for easy, spare-time perusal. That it brings the story right up to the present is an added recommendation in view of the fact that events have developed a habit of crowding in fast upon one another during this last year or so. The author uses an unorthodox, yet pleasing, arrangement of material. He starts by devoting almost half the volume to background elements—Turkish racial origins, environment, religion, and the two dominating factors which have actuated in large part the whole history of the nation: the Armenian question and the question of the Straits. These matters, of course, involve much data reaching into very recent years. Mr. Lengyel then turns back upon himself and takes up in the second half of his book Turkish political history from the beginning of the nation. The consequent parallelism of the two sections of the volume—duplication of material being sedulously avoided by the author—is a strikingly successful literary and practical device.

THE EXPERIENCE OF THE UNITED STATES IN BUILDING AN ARMY

BY SAM H. KELLAM

98 pages . . . Lawrence, Kansas: University of Kansas

"The Problem, that a nation can be defended against a permanent force, by temporary armies, by occasional calls of the husbandman from his plow to the field, was completely disproved, and in demonstrating its fallacy, the independence of America nearly perished in its cradle." With this quotation from John Marshall, loyal soldier and immortal chief justice of the United States, opens a singularly valuable thesis study of the history of America's conscription policy.

The author gives a full account of the workings of the volunteer system during the period between the Revolutionary War and the Spanish-American War, demonstrating well that the security which luck and geographical isolation then provided was nevertheless bought at a waster's price in terms of lost lives, money and property which preparedness might have saved. Next Mr. Kellam proceeds to deal with the story of the development of American conscription, beginning with the Civil War and continuing down to the present day and hour. One welcomes in particular his clear and orderly treatment of our first peace time draft.

Due to its timely interest, though not a book, this thesis is given a place in our Book Review section. Those interested, especially researchers, will find it of much value as an up-to-the-minute story of the procurement of manpower for our national emergencies.

THE ARMED FORCES OF THE PACIFIC

BY CAPTAIN W. D. PULESTON, U.S.N.

273 pages . . . New Haven: Yale University Press

The naval and military might of two great powers whose interests center in the Pacific is the subject of this timely and enlightening study by Captain Puleston. America and Japan—their objectives, their potentialities, and their policies in the East—pass in review well-marshalled for the information of the reader. The author, moreover, does not neglect to provide the background of the situation by describing Japan's nineteenth century emergence from isolation and the successive steps in diplomacy and war by means of which her rapid expansion was effected.

A reader will appreciate such contributions to an understanding of the Far Eastern scene as Captain Puleston's discussions of Japanese military organization and of the comparative size, types, equipment and personnel of the American and Japanese fleets. Singularly helpful for one whose knowledge of naval fighting does not reach too far is a passage describing the various phases of an engagement between two fully arrayed battle fleets, this portion of the volume, incidentally, forming only a part of the hardly less instructive chapter on "Strategy and Tactics."

Captain Puleston writes calmly, methodically, analytically; no stylistic fireworks, rather a good, solid attention to setting down the facts. His book, as a consequence, is one of the best things yet in dealing with the Pacific situation.

THE CURRENT OF WAR

BY CAPTAIN B. H. LIDDELL HART

415 pages . . . London: Hutchinson & Company, Limited

This is Liddell Hart's second book since the World War II started, containing some four hundred pages, mainly newspaper articles of his that were published between 1925 and last January on military subjects, principally army problems and the progress of the war. In it, like in his previous little work of around fifty pages, *Dynamic Defense*, he "is at pains to justify or explain in the light of earlier events" his earlier writings.

Today with the World War in all its magnitude before our very eyes and all the world aflame, one hardly cares to take the time to unearth the controversies of the past. We

feel more like saying "Dead dog" and let it go at that. Not so Liddell Hart.

This work has many interesting accounts of the various operations of the war, and Liddell Hart, always an interesting and forceful writer, does not ever bore one.

To give an idea of the utter impossibility of making a short review of this book, let me quote the headings of the chapters. This in itself will give one a better idea of the book than any review:

The New Horizon: The Next Great War (A 1922 view); A "New Model" Army (1922); Aiming at the Moral Objective.

The Shadow of Coming Events: The Army of a Nightmare (The British Army in 1926); The French Army (A criticism, a forecast, and a suggestion, in 1926); The New British Doctrine of Mechanized War (1929); The Grave Deficiencies of the Army (A warning in 1933); Britain is in Danger (On the threshold of 1939).

Lightning Over Poland (Two confidential estimates of the situation, and two unpublished articles): The Prospect in a War Over Poland (August 27, 1939); The Need for a New Technique (September 9, 1939); Facing The Problem (September 28, 1939); The Best Guarantee Against Aggression (March 19, 1940).

The Lull Before the Storm: Changing the War Minister; Analysis of the War; Will the Cities be Bombed; Is it Stalemate in the West; The Psychological War; "Should We Go to the Assistance of the Finns"; Can Finland Hold Out; Middle East War.

The Storm Breaks—Over Scandinavia: The Invasion of Norway; The Allied Counter-Invasion; An Awkward Balance; The Allied Withdrawal.

The Storm Moves West: The Break-In; The Break-Through; The Knock-Out—of France; The Close-quarter Threat to Britain.

The War in the Mediterranean: The Threat to Egypt; Before the Curtain Rises; The Invasion of Greece; A Vital Turn in the War; The Greek Counter-Offensive.

Epilogue and Prologue: "Can We Take the Offensive in 1941?"

All in all, the book is well worth reading; it will have value for future researchers.

SOCIAL CASE WORK IN NATIONAL DEFENSE

By Pauline V. Young

292 pages . . . New York: Prentice-Hall, Inc.

It is hard to think of a book which could be more timely and more precisely the response to an urgent military and public need than this book of Miss Young, which provides an approach to the problems of the enlisted men of the service and their families. The impact of the current defense program upon the lives, relationships and financial position of countless individuals—creating for the soldier and his dependents so many problems of an economic and emotional nature—calls for an intelligent understanding of the situation on the part of those to whom the soldier's welfare is entrusted. A grasp of the typical fact-pictures, an appreciation of the basic influences at work, will help an officer immeasurably in dealing with the various cases when they arise.

As the book points out, there is definite and intimate connection between the morale of the armed forces and the problems, perplexities and anxieties which may beset the soldier. Desertion and A.W.O.L. cases can be more accurately analyzed in the light of the offender's background. One experienced officer has said that with a correct approach to the soldier's problems the desertion rate could be cut 75 per cent. Miss Young's book seeks to present that scientific approach.

There is a drawback, however, in this respect: the book is a little ponderous, detailed and over-thorough—too much the textbook or treatise type—for convenient reading by the average officer. There is still need of a brief, simple manual on the subject that can be digested quickly by those for whom time is at a premium. For this reason one doubts that Miss Young's volume is exactly what the officer, in his usual circumstances today, would like.

For the Morale Officer, though, for the officer who has considerable court-martial duties to discharge, for the officer whose work is in a strict sense the work of personnel, *Social Case Work in National Defense* is a study highly to be recommended.

HOW TO BECOME AN OFFICER U.S. ARMY

By Major Arthur Vollmer, Cavalry, U.S.A.

98 pages . . . New York: Hastings House

This little book arrives to fill a distinct place in the pattern of current military needs. A wealth of good writing has been done in the past on how properly to discharge the duties of officership once one has reached that position. Very creditable volumes, also, have dealt in a general way with the question of how one goes about *becoming* an officer in the first place. But lack existed of a handbook which, in addition to describing the process of getting to be an officer, would go into such small but troublesome details as: specifically what Army Regulations, pamphlets or other government documents are concerned with the various appointments; exactly what is the number or identification of the pertinent regulation or government document; where would you write to get a copy of an applicable pamphlet if you wanted one; how much would it cost to get it? These, and similar questions. For which reason it is a satisfaction that Major Vollmer's new book can be put into the hands of young men who aspire to officership but are baffled about the minute details of getting there.

The reader can obtain information regarding methods of appointment in becoming a Private, First Class; a non-commissioned officer; a Flying Cadet; a Cadet in the United States Military Academy; a warrant officer; a commissioned officer in the Regular Army, National Guard or Officers Reserve Corps; a student in the R.O.T.C.; or a specialist. Promotions, likewise, are fully discussed; and chapter and verse are quoted scrupulously throughout from Army Regulations or other government documents. The information is all there, and amazingly easy to find.

Directory of Periodicals

Included in this directory are only those periodicals from which articles have been selected. See also "List of Periodicals Indexed and Key to Abbreviations."

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"NEW WORLDS FOR OLD"
A JOB FOR FIGHTERS. Roger Tennant
MODERN COCKPIT CONTROLS AND EQUIPMENT. Gordon H. G. Garbett

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ARMY MEDICAL BULLETIN

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THE CLINICAL USE OF THE SULFAMIDO COMPOUNDS. O. H. Perry Pepper, M.D.
VACCINATION AGAINST YELLOW FEVER

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OUR NEW MEDIUM TANK. A FAST, HEAVILY ARMORED VEHICLE OF GREAT FIRE POWER. Lieut. Colonel J. K. Christmas
ORDNANCE IN THE NEW ARMY. THE FIELD UNITS FOR MAINTENANCE AND SUPPLY

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RAILWAY ARTILLERY. AN OUTMODED ELEMENT OF OUR SEACOAST DEFENSE? Major General Johnson Hagood, U. S. Army, Retired
THE MODERN SCOUT CAR. A NEW ARMORED VEHICLE OF INCREASED FIRE POWER AND MOBILITY. Captain Charles Hiller, Jr., Ordnance Reserve
PLANNED MUNITIONS, II. THE SECOND PHASE OF THE CURRENT ARMAMENT PROGRAM. Lieut. Colonel Henry S. Aurand

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ORDNANCE ON THE MARCH. AN ALL-TIME RECORD OF ARMS PRODUCTION. Robert P. Patterson, Under Secretary of War
AMMUNITION AT THE FRONT. THE SYSTEM OF SUPPLY TO TROOPS IN THE FIELD. Brigadier General J. K. Crain
HALF-TRACKS FOR MOBILITY. NEW SCOUT CARS AND PERSONNEL CARRIERS FOR THE MODERN ARMY. Major J. E. B. McInerney
GAGES FOR GUNS. INTERCHANGEABILITY OF PARTS GOVERNS ORDNANCE PRODUCTION. Lieut. Colonel Harry B. Hambleton
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AIR POWER AND COAST DEFENSE. HAS THE BOMBARDMENT AIRPLANE MADE THE UNITED STATES INVASION-PROOF? Lieut. Colonel Thomas R. Phillips
A NEW LIGHT RIFLE. A SEMIAUTOMATIC CARBINE TO REPLACE THE PISTOL AND SUBMACHINE GUN. Lieut. Colonel René R. Studler
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ARMY QUARTERLY (Great Britain)

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"MORAL" IN THE WAR 1914-1918. Major-General Sir Andrew McCulloch
COMMAND — TRAINING THE MIND'S EYE. Lieutenant Colonel Graham Seton Hutchison
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THE WAR AT SEA. MARCH-APRIL, 1941
THE PROTECTION OF MECHANICAL TRANSPORT AGAINST A.F.Vs. (ARMOURED CARS) IN THE BACK AREAS. Major A. H. C. P. T. Houchin
THE SOLDIER AS EMPIRE BUILDER. Major T. J. Edwards

CAVALRY JOURNAL

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MOUNTAIN TROOPS. REMOUNTS FOR MOUNTAIN UNITS OF THE GERMAN ARMY. Colonel von Jena, German Army
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ODOR IDENTIFICATION OF CHEMICAL WARFARE AGENTS. Captain E. M. Hoshall
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TRIP TO BAGUIO AND BANAUE. Colonel Joseph T. Cottrell
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[La instruccion en el Ejército.] Colonel Barrueco

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[El sitio de Malta en 1565.] Colonel Ribas de Pina.

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GERMAN ASSAULTS UPON PERMANENT FORTIFICATIONS. Captain C. T. Schmidt

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INTERNATIONAL MILITARY SURVEY: A PRIVATE'S VIEW OF THE GERMAN ARMY

July 1941

COUNTER-BREAKTHROUGH. Part One. Major H. W. Ehrgott
MILITARY GEOGRAPHY OF THE NEAR EAST. Anonymous
FIGHTING MAN'S NEW HEADGEAR. Major H. G. Sydenham
THE ART OF OBSCURITY. Lieutenant Monoxide
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WEAPONS OF GERMAN AND BRITISH INFANTRY BATTALIONS. Captain Carl T. Schmidt
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FROM THE CHIEF'S OFFICE: THE SERVICE COMPANY

August 1941

ARMY AND SUPER-ARMY. Anonymous
VEHICLE SPACING IN MOTOR COLUMNS. Captain Warren S. Everett
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COUNTERBREAKTHROUGH. Part Two. Major H. W. Ehrgott
PHYSICAL EFFICIENCY. Lieut. Colonel John C. Newton
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CONTINUOUS TRACKING WITH THE FIFTY-CALIBER. Sergeant Alva H. Denham
MODERN INFANTRY IN RIVER CROSSING. Captain T. H. Lipscomb
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FROM THE CHIEF'S OFFICE: THE MEDICAL DETACHMENT, INFANTRY REGIMENT
FROM THE CHIEF'S OFFICE: EXPERIMENTAL MOTORIZED DIVISION
THE INFANTRY MIND (Editorial)
THE 105-MM HOWITZER (Editorial)
HOME DEFENSE. Tom Wintringham

September 1941

WAVELL'S MIDDLE EAST COMMAND. Dr. H. A. DeWeerd
BREAKTHROUGH ON THE SOMME. Captain Paul W. Thompson
A MIRROR FOR UMPIRES. Lieut. Colonel John U. Ayotte
COUNTERBREAKTHROUGH. Part Three. Major H. W. Ehrgott
MEN, FEAR AND PANIC. Major Thomas E. Stone
THE INFANTRY TRUCK. Sergeant Terry Bull
AROUND THE BASES: THE WEST INDIES. Anonymous
FORT ON THE FRONTIER. Captain Fairfax Downey
FROM THE CHIEF'S OFFICE: THE HEADQUARTERS COMPANY (RIFLE REGIMENT)
"GERMAN PSYCHOLOGICAL WARFARE." Reviewed by Prof. E. R. Guthrie

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS (Great Britain)

April 1941

MUSINGS ON MEDICAL EVACUATION IN MOBILE WARFARE. Major I. H. Lloyd-Williams

May 1941

THE TREATMENT OF THE SOLDIER'S FOOT. Major Arthur J. Helfet
A NEW KIND OF SHOCK
HAND CARRIAGE OF WOUNDED. Captain W. D. Livingstone Smith

June 1941

THE WORK OF A REGIMENTAL MEDICAL OFFICER. Colonel D. Steward Middleton
DIGESTIVE DISORDERS IN THE FORCES. Lieut. Colonel J. Gibson Graham
THE VALUE OF THE LOW SPINAL BLOCK (LUMBO-SACRAL) ANALGESIA IN THE TREATMENT OF SHOCK ASSOCIATED WITH WOUNDS OF THE LOWER EXTREMITIES. Major A. Kerr Boyle
MINIATURE RADIOGRAPHY AND SPUTUM EXAMINATION IN 100,000 AUSTRALIAN RECRUITS. (Editorial)
THE CLARIFICATION OF WATER FOR RE-USE BY A MOBILE BATH UNIT. Major G.V. James
ANAESTHETIC APPARATUS FOR USE IN THE FIELD. Major R. Binning

July 1941

BURNS IN WARTIME. Major Michael C. Oldfield
TREATMENT OF BURNS IN WARTIME. Major Wallace M. Dennison
THE ASSESSMENT OF FUNCTIONAL RECOVERY AFTER WAR WOUNDS OF THE LIMBS. Lieutenant Colonel Ralph Brooke
RHEUMATISM IN THE ARMY AND THE RATIONAL CAMPAIGN AGAINST IT. Surgeon Lieutenant A. J. Mester, Polish Army
THE PROPHYLACTIC TREATMENT OF VENEREAL DISEASE. Major J. M. Officer
PERSONAL EXPERIENCES IN FRANCE. Lieutenant D. I. McCallum

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

April 1941

THE WAR IN THE CRIMEA. 1854. No. 1. Major J. H. Leslie
NOTES ON GERMAN ARTILLERY ORGANIZATION AND EQUIPMENT. Lieutenant G. A. Minto
THE DRAMA OF EARLY INVASIONS OF BRITAIN. Lieut. General Sir George MacMunn
THE HISTORY AND TRADITIONS OF THE ROYAL ARTILLERY. Colonel E. A. P. Hobday

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION (Great Britain)

May 1941

THE AIR BATTLES FOR BRITAIN
ARMY WELFARE AND EDUCATION. Major-General H. Willans
SUGGESTIONS FOR UNIT TRAINING. Major M. P. Huthwaite
THE NAVIES OF THE CHIEF SEA POWERS. Maurice Prendergast
THE ITALIAN FAILURES. Major-General H. Rowan-Robinson
DIARY OF THE WAR

MARINE CORPS GAZETTE

June 1941

MARINE CORPS AVIATION. Lieutenant Colonel Harold C. Major
SOME EXPERIENCES IN FREE CHINA. Major F. J. McQuillen
MARINE CORPS RIFLE TESTS: SPRINGFIELD, GARAND, JOHNSON, WINCHESTER
GUERRILLA WARFARE IN CHINA. Captain James B. Griffith
KEEP THEM FIRING. A STUDY OF MALFUNCTIONS AND STOPPAGES. Captain Melvin M. Johnson, Jr., USMC-Reserve
TANKS AND TERRAIN. Lieutenant Robert A. McGill
A CRITICAL ANALYSIS OF THE BRITISH OPERATION IN GERMAN EAST AFRICA DURING THE WORLD WAR. Captain Robert O. Bowen

MILITARWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

April 1941

ENGLAND'S PREPAREDNESS POTENTIALITY AT THE OUTBREAK OF WAR IN 1939.
[Englands rüstungswirtschaftliches Potential.] Field Marshal Pflug

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THE THEATER OF WAR IN NORTH AFRICA.
[Der Kriegsschauplatz in Nordafrika.] Colonel Rudolf Mlaker

A detailed description of the climate, topography and also of the economic development of Libya and Northwestern Egypt, particularly as it affects the coastal region, along the Mediterranean.

May 1941

MONROE DOCTRINE — PAN-AMERICANISM — U.S.A. — IMPERIALISM.
[Monroe-Doktrin — Panamerikanismus — USA.-Imperialismus.] Captain v.Handel-Mazzetti

This discussion pertains to the various politico-economic relationships entered into during the past several decades and particularly concerning efforts to unite the hemisphere in more recent years.

THE CONFLICT IN THE FAR EAST.
[Der Konflikt in Ostasien.] Major General v.Lerch

This article is a sequel of a series on this general subject and covers the period of 20 January to 31 March 1941. In it are discussed the military accomplishments in north China, inner Mongolia, central and south China. Also described are the positions held by the Chunkking government and by the new Chinese Nationalist government. The concluding portion on "The New Order in the Far East" the present domestic and foreign politics of Japan are discussed.

June 1941

CONTEMPORARY DEFENSE SKETCHES. THE THEATER OF OPERATIONS IN MACEDONIA AND ALONG THE AEGEAN.
[Wehrpolitische Skizzen zum Zeitgeschehen. Der Kriegsschauplatz in Mazedonien und an der Agais.] Colonel R. Mlaker

This short article, with a large sketch, vividly describes the topography and the theater of operations in the early stages of the Grecian campaign of early 1941. The author observes in closing his discussion that it is now a well-determined fact that this theater of war made extreme demands upon both leadership and men in view of its mountainous terrain, its poor and insufficient good roads and roadnets, as well as due to the climatic peculiarities confronted.

IMPORTANT FUNDAMENTALS IN THE CONSTRUCTION OF FIELD GUNS.
[Wichtige Grundsätze beim Bau von Feldgeschützen.] Major General Martinovsky-Babos

This technical discussion is illustrated by 14 sketches. It treats of barrel weights and center of gravity, the gun carriage, materials used in production of guns, the matter of keeping costs at a minimum by omitting expensive machining methods. It is hoped that new production methods will reflect reductions in weight or the increase of efficiency of performance from 25 to 50 percent.

July 1941

PREPARATIONS FOR WAR, 1914-1939.
[Kriegsvorbereitungen 1914-1939.] Field Marshall O. Pflug

JAPAN AS A SEA POWER.
[Japan als Seemacht.] Dr. Walter Flemming

THE CONFLICT IN THE FAR EAST.
[Der Konflikt in Ostasien.] Major General Lerch

This installment covers the period 1 April to 15 June 1941.

MILITARWISSENSCHAFTLICHE RUNDSCHAU (Germany)

March 1941

MONOGRAPHS OF THE WAR ON THE WESTERN FRONT.
[Einzelschilderungen aus dem Kriege an der Westfront.]

Stromberg on 10 May on the outside left flank of the attack in the west.
The 84th Infantry crosses the Meuse at Ivoire on 14 May.
The 14th Company of the 28th Infantry resists the French tank attack at Denée, 15 May.
The attack of the 2d Company, 28th Infantry Battalion on Fort Bousois on the northeast front at Maubeuge, 21 and 22 May.
The 1st Battalion, 396th Infantry in the battle for Lys, 26 May.
The capture of Calais, 26 May.
The 2d Battery, 61st Field Artillery crosses the Aisne, 7 and 8 June.
The communications system in the attack on Nancy, 18 June.

DO MILITARY MAPS MEET MODERN DEMANDS?
[Genügt das militärische Landkartenwesen unseren heutigen Ansprüchen?] Dr. Siewke

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CONCERNING THE STRATEGIC SITUATION IN THE MEDITERRANEAN.
[Zur strategischen Lage im Mittelmeer.] Rear Admiral Lützow

June 1941

MONOGRAPHS OF THE WAR ON THE WESTERN FRONT.
[Einzelschilderungen aus dem Kriege an der Westfront.]

Employment of land and air forces in Belgium, 10 May.
The capture of Lummen on the Albert Canal by the 53d Infantry, 12 May.
Experiences of the high command of the Fourth Army during the battles between the Meuse and the Sambre, 15 and 16 May.
The local engagement of the SS ("Schutzstaffel") troops pioneer battalion in L'Arbre de Guise, 19 May.
The assault troop engagement of the 111th Infantry at Bachy, 24 May.
The employment of the 1st Battalion, 196th Infantry in Berbers Woods, 24 and 25 May.
Engagements of the 2d Company, 110th (Armored) Infantry between the Somme and Bresle, 5 and 6 June.
The crossing of the 38th Infantry over the Oise at L'Isle Adam, 12 June.
The battle for Verdun on the east side of the Meuse and the capture of Forts Vaux and Douaumont by the 211th Infantry, 15 June.
The attack of the 7th Company, 134th Infantry on La Roche-Posay on the Creuse, 22 June.
The surprise attack upon British Channel Islands, 1 July.

THE FRENCH DEFENSE AGAINST THE GERMAN BREAKTHROUGH ACROSS THE MEUSE BETWEEN SEDAN AND NAMUR IN MAY 1940. (According to French Reports)
[Der Abwehrkampf der Franzosen gegen den deutschen Durchbruch über die Maas zwischen Sedan und Namur im Mai 1940.]

MILITAR-WOCHENBLATT (Germany)

18 April 1941

THE SPIRIT OF THE GERMAN SOLDIER.
[Der Geist des deutschen Soldaten.] General B. Ludwig

In this article the author declares that the spirit of the German soldier is no different than it was in 1914. He strives to show that his morale has remained at high level and that, by his deeds the German soldier shows that he understands that the greatest caution is at times exercised by greatest daring.

25 April 1941

ITALY IN THE PRESENT WAR.
[Italien im jetzigen Krieg.] Colonel R. v.Xylander

This is a continuation of a series of articles by this author on this subject. This installment is entitled "The Winter Campaign against Greece to the end of the Year." Two sketches indicate fronts held by the Italians in Albania from 19 November to 31 December 1940.

THE THEATER OF WAR IN NORTH AFRICA.
[Der Kriegsschauplatz in Nordafrika.] Dr. O. Constantini

A detailed description of the North African coastal region, including a discussion of climate, terrain, political and transportation development.

2 May 1941

ACCOMPLISHMENTS OF THE GREEK ARMY IN THE WARS FROM 1897 TO 1922.
[Die Leistungen des griechischen Heeres in den Kriegen von 1897-1922.] Colonel Aschenbrandt

Six sketches illustrate this article. The first indicates the Grecian territory as of 1897 and the gains made by adding Macedonia in 1913 and Thrace in 1918. A second shows opposing Greek and Turkish forces in Thessaly, 17 April to 18 May 1897. Two pertain to the Balkan wars of 1912 and 1913. Another shows the Greek position on 14 September 1918 and still another, her position in Asia Minor on 25 August 1922.

9 May 1941

THE OCCUPATION OF DENMARK.
[Die Besetzung Dänemarks.] Major Macher

This article, written to commemorate the first anniversary of the occupation of Denmark, on 9 April 1941, sets forth in detail the reasons for and methods of occupying Denmark.

THE STRATEGIC SIGNIFICANCE OF THE GRECIAN RAILROAD NET.
[Das griechische Eisenbahnnetz in seiner strategischen Bedeutung.] Dr. O. Constantini

23 May 1941

THE GERMANS, SPANIARDS AND FRENCH AS SOLDIERS. A REVIEW OF MILITARY HISTORY OF RECENT CENTURIES.
[Deutsche, Spanier, Franzosen als Soldaten.] Dr. E. Schultze

In this discussion are traced the German soldierly traits. The author, through frequent references to specific battles in various wars, tends to stress "German talent for organization" and to show how the Prussian military system was gradually developed.

30 May 1941

ANTIAIRCRAFT IN THE WORLD WAR. IN FRANCE, 21 MARCH TO 6 APRIL 1918.
[Flak im Weltkriege.] (I) Lieut. Colonel Büdingen

Included in this article is a tabulation of the antiaircraft guns, searchlights and machine guns available to the Second, Seventeenth and Eighteenth German Armies.

6 June 1941

ANTIAIRCRAFT IN THE WORLD WAR. THE AIR WARNING SERVICE.
[Flak im Weltkriege.] (II) Lieut. Colonel Büdingen

In this installment the author describes the development of air warning service since late 1914. He concludes with a statement that, while a systematic development of an air warning service makes demands to provide a constant, faithful and tireless readiness, it does protect the rear portion of the theater of operations and home itself from surprise air attacks.

NATURAL RESOURCES OF EGYPT AND ARABIA.
[Agyptens und Arabiens Bodenschätze.] Dr. P. Ruprecht

This discussion deals primarily with the production and potential production of oil. Emphasis is laid, however, also upon the importance of manganese and, incidentally, of the availability of potash in Palestine.

13 June 1941

GERMAN SOLDIERY. THE CROSSING OF THE MARNE AND THE CAPTURE OF VARENNES, 10 AND 11 JUNE 1940, BY THE 2D BATTALION, 35TH (ARMORED) INFANTRY.
[Deutsches Soldatentum: Ubergang über die Marne und Einnahme von Varennes am 10./11. 6. 1940 durch II./I.R. 35.]

ENGLISH SUPPLY ACROSS THE CHANNEL.
[Der englische Nachschub über den Kanal.] Dr. Schüddekopf

Deals with the British supply problems in World War I, particularly as to the crossing of the English Channel.

27 June 1941

GERMAN SOLDIERY. AN ACCOUNT OF THE BATTLE AT GIVRY-EN-ARGONNE. 14 JUNE 1940.
[Deutsches Soldatentum: Bericht über das Gefecht bei Givry-en-Argonne am 14. 6. 1940.] Lieutenant Reichstein

4 July 1941

GERMAN SOLDIERY. ARMORED FORCES IN THE BATTLE AT MT. OLYMPUS.
[Deutsches Soldatentum: Panzerschützen im Gebirgskampf am Olymp.] Lieutenant Künzel

11 July 1941

THE FRENCH VERSION OF THE BREAKTHROUGH AT THE MEUSE.
[Der Durchbruch an der Maas in französischer Darstellung.] (I) Lieutenant Colonel Gaul

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FINANCES AND OIL IN IRAQ.
[Finanzwesen und Erdöl im Irak.] Dr. P. Ruprecht

18 July 1941

THE FRENCH VERSION OF THE BREAKTHROUGH AT THE MEUSE.
[Der Durchbruch an der Maas in französischer Darstellung.] (II) Lieutenant Colonel Gaul

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THE COOPERATION BETWEEN CAPTIVE BALLOONS AND OTHER WEAPONS, 1914-1918.
[Die Zusammenarbeit der Fesselballone mit den anderen Waffen im Weltkriege 1914-1918.] (I)

HOW MUCH SHOULD ARMY DRAFT HORSES WEIGH?
[Wie schwer sollen die Zugpferde des Heeres sein?] Lieut. Colonel Buhle

25 July 1941

GERMAN SOLDIERY. BATTLE FOR THE BRIDGE AT VILLENEUVE-SUR-YONNE AND THE FORMING OF A BRIDGEHEAD.
[Deutsches Soldatentum. Kampf um die Brücke bei Villeneuve-sur-Yonne und Bildung eines Brückenkopfes.] Lieutenant Künzel

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THE COOPERATION BETWEE CAPTIVE BALLOONS AND OTHER WEAPONS, 1914-1918.
[Die Zusammenarbeit der Fesselballone mit den anderen Waffen im Weltkriege 1914-1918.] (II)

MILITARY AFFAIRS

Journal of the American Military Institute
Summer 1941

OUR NATIONAL GUARD. AN INTRODUCTION TO ITS HISTORY. Frederick P. Todd
THE MODERN ITALIAN NAVY. II: SINCE 1900. Theodore Ropp

MILITARY ENGINEER

May-June 1941

BLACKOUTS. Major Charles W. Stewart, Jr.
BARRIER TACTICS. Major L. E. Seeman
MODERN MILITARY OBSTACLE TECHNIQUE. Major W. E. Potter
GULF COAST WATERWAYS. Leo M. Odom
THE AIR TRANSPORT INDUSTRY IN THE NATIONAL DEFENSE. T. B. Wilson
ENGINEERS IN BATTLE. (II) Captain Paul W. Thompson
MILITARY OIL STORAGE. B. Orchard Lisle
NEW PORTABLE TIMBER MILITARY BRIDGE. Captain Theodore C. Combs and Captain Ben Benioff
NAVY CONTRACT LUBRICANTS. Major G. E. Linkswiler
CONSTRUCTION OF A SEMI-PERMANENT CAMP AT FORT BUCHANAN, PUERTO RICO. Captain A. H. Bagnulo
CONSTRUCTION OF THE PUERTO RICAN GENERAL DEPOT. Captain James E. Walsh
EMERGENCY PON BRIDGE AT HIDALGO, TEXAS. Captain J. W. Beretta
DEVELOPMENTS IN DESIGN OF PONTON BRIDGES. Captain D. E. Swift

July-August 1941

MILITARY ENGINEERS TODAY. Major General Julian L. Schley
MILITARY OBSTACLE COURSE
ENGINEERS IN BATTLE. (III) Captain Paul W. Thompson
INSPECTION OF THE WASHINGTON NATIONAL AIRPORT. Howard L. Cheney
AIR RAIDS AND PROTECTIVE CONSTRUCTION. Sherwood B. Smith
PREFABRICATED WOOD HANGARS. Thomas D. Peters
BOLIVIA AND THE ARICA-SANTOS RAILWAY. Captain LeRoy Bartlett, Jr.
THE UPPER MISSISSIPPI RIVER PROJECT. Colonel Charles P. Gross, & H. G. McCormick
MILITARY BRIDGES AND BRIDGING. Captain C. E. Mullins
RUBBER IN THE NATIONAL DEFENSE. F. L. Haushalter
RUSSIA IN THE WORLD WAR, 1914-1918. A. M. Uzefovich

MILITARY SURGEON

June 1941

THIRTY-ONE HUNDRED MILES WITH THE FIRST MEDICAL REGIMENT. Captain J. B. Coates, Jr.

THE MEDICAL AND SANITARY CARE OF CIVILIAN POPULATION NECESSITATED BY ATTACKS FROM HOSTILE AIRCRAFT. Captain H. C. Lueth

THE RELIEF OF PRURITUS BY BENZOYL PERSULFIDE, ESPECIALLY IN DERMATITIS FROM POISON IVY AND IN INSECT BITES. Samuel Amberg, M. D., and Luis A. Brunstinz, M.D.

UROLOGY IN WAR. Major V. C. Laughlin

NEUROPSYCHIATRIC EXAMINATION FOR INDUCTION OR ENLISTMENT IN THE ARMY. Theo J. C. von Storch, M.D., and Geo. O. Pratt, M.D.

PROBLEMS OF VENTILATION FOR VESSELS OF THE NAVY. Lieutenant A. R. Behnke, Jr., U. S. Navy

TREATMENT OF RATTLESNAKE BITE. Lieutenant F. Speer, U.S.N.R.

TREATMENT OF GONORRHEA WITH SULFATHIAZOLE. Lieutenant H. M. Boslow

July 1941

THE CIGARETTE, THE SOLDIER, AND THE PHYSICIAN. FUNDAMENTAL FACTORS OF THE PROBLEM. Major C. Ward Crampton, Med. Reserve

COMMENTS ON THE FIRST ARMY MANEUVERS IN NEW YORK. Colonel Dunlap P. Penhallow

TREATMENT OF WAR WOUNDS BASED ON THEIR BACTERIOLOGY. Lieut. Colonel T. H. Sweetser, Med. Reserve

SHOCK, BLOOD TRANSFUSION AND SUPPORTIVE TREATMENT. R. Charles Adams, M.D.

NATURE AND THE TREATMENT OF SHOCK. Captain Warner F. Bowers

RADIOLOGY IN MILITARY PRACTICE. Lieut. Colonel B. R. Kirklin, Med. Reserve

SOME EYE, EAR, NOSE AND THROAT FINDINGS IN MEN BEING EXAMINED FOR ENROLLMENT IN THE CIVILIAN CONSERVATION CORPS. Lieut. Commander F. G. Fox, U. S. Naval Reserve

"ATMOSPHERIC CHAMBER" FOR FLIGHT EXAMINATIONS. Major V. P. Flynn, U. S. Army, Reserve, and Lieutenant S. E. Flynn, U. S. Navy

August 1941

MALINGERING — A STUDY. Lieutenant Colonel Albert G. Hulett

SCURVY, THE SOLDIER'S CALAMITY. Major Victor E. Levine, Spec-Res

THE EFFECT OF MILITARY REQUIREMENTS ON CIVILIAN AVIATION. D. R. Brimhall, Ph.D.

MEDICAL MILITARY TRAINING FOR CIVILIANS. Lieut. Colonel Cyril B. Courville, Med-Res

A UNIQUE APPARATUS FOR COOKING AND FOR BOILING WATER IN THE FIELD. Colonel Dunlap P. Penhallow

CYCLOPROPANE ANESTHESIA IN MILITARY SURGERY. Major J. F. Kellogg, Med-Res, Lt. Comdr. Richard B. Phillips, M.C.-V(S), U.S.N.R., and S. LeRoy Sahler, M.D.

FIRST AID AND EMERGENCY TREATMENT OF GUNSHOT WOUNDS OF THE JAWS. Colonel Robert H. Ivy, Med-Res

ANIMAL CASUALTIES FROM CHEMICAL WARFARE AGENTS. Captain Don L. Mace

NAVAL INSTITUTE PROCEEDINGS

June 1941

THE INFLUENCE OF DEMOCRACY UPON SEA POWER. Alexander Kiralfy

THE TRUTH OF THE HAMPSHIRE AFFAIR. THE TRAGEDY WHICH TOOK LORD KITCHENER 25 YEARS AGO. Lieutenant H. S. Mazet, USMC Reserve

ELIMINATING BOTTLENECKS IN NATIONAL DEFENSE. B. Orchard Lisle

CHILE. Rear Admiral A. T. Beauregard

THE ALEUTIANS — THEIR STRATEGIC IMPORTANCE. W. L. Goldsborough

July 1941

AIR POWER IS SEA POWER. Commander Logan C. Ramsey

OIL FOR THE WORLD'S NAVIES. Rear Admiral Harry A. Stuart, & R. G. Tracie

THE CARIBBEAN — AN AMERICAN LAKE. Lieut. Commander Ephriam R. McLean, Jr.

COLOMBIA. Rear Admiral A. T. Beauregard

MARINE PARACHUTE TRAINING. Captain R. H. Williams, U.S.M.C.

THE COAST GUARD AS A NAVAL ASSET. Chief Boatswain F. C. Herold

August 1941

THE FUTURE FLEET. Lieutenant Franklin G. Percival, U. S. Navy (Ret)

EMPORIUMS AFLOAT. Lieutenant Commander Frederick J. Nelson

TORPEDO BOATS. Captain H. A. V. von Pflugk

THE BYZANTINE RECONQUEST OF CRETE. Arthur MacC. Shepard

ECUADOR. Rear Admiral A.T. Beauregard

THE ORDNANCE SERGEANT

June 1941

HISTORY OF THE DEVELOPMENT OF FIELD ARTILLERY MATERIEL. (I) Lieutenant O. A. Ramnes

July 1941

KEY WEST BARRACKS, FLORIDA. Tech. Sergeant Oscar Davis

HISTORY OF THE DEVELOPMENT OF FIELD ARTILLERY MATERIEL. (II) Lieutenant O. A. Ramnes

August 1941

THE ORDNANCE DISTRICT OFFICE. ITS PURPOSE AND OPERATION

SMALL ARMS. Lieutenant C. B. Goodman

PROCUREMENT OF A FIELD ARTILLERY WEAPON. (III) LIEUTENANT O. A. Ramnes

OUR ARMY

July 1941

ARMORED ATTACK. J. Franklin Whitman, Jr.

DIE PANZERTRUPPE (Germany)

April 1941

THE ASSAULT ON THE MAGINOT LINE.
[Zur Erstürmung der Maginot-Linie.]

This describes in detail the Hackenberg fortification, reputedly one of the strongest in the Line. A sketch and several pictures illustrate the short article.

RECONDITIONING OIL.
[Altölregenerierung.]

By again distilling and refining used oil, this article points out, the oil is "regenerated" to its original qualities as for lubrication, combustion, viscocity and freedom from harmful impurities. The necessity for economy in the use of oil is emphasized.

May 1941

BATTLE EXPERIENCES IN THE WEST. RECONNAISSANCE FAR INTO HOSTILE TERRITORY.
[Kampferlebnisse im Westen. Als Spähtrupp tief in feindesland.]

TRANSPORTATION DEVELOPMENT IN THE NEAR EAST.
[Die Verkehrsentwicklung im vorderasiatischen Raum.]

Concluding article of a series describing the railroad and highway routes in the Near East. Present and contemplated routes are shown in four sketches accompanying the article, with indications as to standard and non-standard gauge railroads.

June 1941

GERMAN MOTOR TRANSPORT TROOPS IN IRAQ.
[Deutsche Kraftfahrtruppen im Irak.]

THE TECHNIQUE OF A LECTURE.
[Zur Technik des Vortrags.]

This discussion of how best to conduct the training of "Schnelle Truppen" (mobile troops) concerns the detailed method of preparing and delivering a lecture before a class. It is emphasized that the technical training of men in "Schnelle Truppen" service is singular because the men are so frequently required to make individual decisions, followed by prompt action.

QUARTERMASTER REVIEW

May-June 1941

QUARTERMASTER CORPS ACTIVITIES IN THE HAWAIIAN DEPARTMENT. Lieut. Colonel Franz J. Jonitz

"THERE IS NOTHING NEW UNDER THE SUN." Colonel H. L. Whitaker

THE DEPOT INSPECTION SECTION, PHILADELPHIA QM DEPOT. Captain James C. Davie

GERMAN ARMY MOTOR TRANSPORTATION. (Foreword by Holabird)

DRIVING IN COLUMN AND LEADING ONE. Captain Von Nida

July-August 1941

TRAINING THE QUARTERMASTER CORPS. Prepared by Public Relations Branch, O.Q.M.G.

FEEDING THE NEW ARMY. Mary I. Barber

RAIL TRAFFIC

HOW TO DO IT. Major D. S. Buchenholz, QM-Res

A SUGGESTION FOR SALES OFFICERS. Lieutenant J. M. Kelly

RECRUITING NEWS

August 1941

HIGH COMMANDERS OF THE A.E.F.: WILDS PRESTON RICHARDSON

RESERVE OFFICER

June 1941

SELECTIVE SERVICE. Major Ernest M. Culligan

THE MILITARY RAILWAY SERVICE. Colonel Carl R. Gray, Jr., Manager, Military Railway Service

July 1941

GLIDERS FOR NATIONAL DEFENSE. Commander E. F. McDonald, Jr.

"BLITZ" SERVICE

SO THE TANKS WILL COME. Captain Howard C. Crawford

August 1941

BALLOON BARRAGE. Captain E. J. Barnett
STATUS OF THE ARMORED FORCE
PROTECTION AGAINST CHEMICAL WARFARE. Lieutenant Louis E. Schueler, CWS-Res
MIGHT FROM THE SKIES. Lieutenant R. R. Corey
MOTOR TRANSPORT TRAINING

REVISTA MILITAR (Argentina)

April 1941

REGARDING THE FRENCH ARMY (WITH SPECIAL REFERENCE TO INFANTRY).
[Sobre el ejército francés.] Brig. General Jorge A. Giovaneli

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NEW REFLECTIONS CONCERNING MOTORIZATION.
[Nuevas reflexiones sobre motorizacion.] (I) Major Alfredo A. Baisi

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ARMY CAVALRY.
[Caballeria de ejército.] Major A. G. Fernandez

SERVICES OF A GROUP OF LIGHT ARTILLERY DURING AN OFFENSIVE.
[Los servicios de un grupo de artilleria liviana en el staque.] Major J. A. Beverina and Captain A. J. Alderete

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THE AUXILIARY AXIS OF COMMUNICATIONS.
[Central de comunicaciones de cambio.] Captain H. B. Noblina

MATERIAL OF PONTOON BRIDGES IN THE GERMAN ARMY.
[El material de puentes sobre pontones del ejército alemán.] Lieutenant E. A. Bonnecarrere

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TACTICAL PROBLEM. REINFORCED BATTALION IN A MEETING ENGAGEMENT.
[Temas tácticos.] (I)

THE "UNDISCOURAGED ENGINEERS"; THE 24TH ENGINEER BATTALION AT THE CROSSING OF THE MARNE IN JULY 1918.
[Los "Zapadores de Unverzagt," Batallon No 24 de Zapadores, en el franqueo del Marne, en julio de 1918.]

May 1941

CONCERNING THE FRENCH ARMY. MOUNTAIN INFANTRY.
[Sobre el ejército francés: Las tropas de montana.] Brig. General Jorge A. Giovaneli

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NEW REFLECTIONS CONCERNING MOTORIZATION.
[Nuevas reflexiones sobre motorizacion.] (II) Major A. A. Baisi

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INFORMATION SERVICE OF THE ARTILLERY.
[Servicio de noticias de artilleria.] Major G. G. Reynoso

TACTICS OF CHEMICAL WARFARE.
[Táctica de guerra quimica.] Lieutenant Enrique C. Lutteral

June 1941

THE HIGH COMMAND OF ARMED FORCES.
[El mando superior de las fuerzas armadas.] Colonel Jorge B. Crespo

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REVISION OF OUR CONCEPTS OF THE EMPLOYMENT OF MILITARY AVIATION.
[Hacia una revisacion de nuestros conceptos de empleo en la avacion militar.] Major J. O. Arana

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TOPOGRAPHIC BASES FOR THE ARTILLERY.
[Bases topográficas para artilleria.] Captains A. L. Ozaran and R. C. Perazzo

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COMMUNICATIONS PLATOON OF THE ARTILLERY.
[El peloton de enlace de artilleria.] Lieutenant F. A. Galindez

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TACTICAL PROBLEM. REINFORCED REGIMENT.
[Temas tácticos.] (II)

THE BLOWING UP OF AN ENGLISH TANK IN FRONT OF THE MOST ADVANCED LINES DURING THE BATTLE OF FLANDERS BY THE 52D RESERVE ENGINEERS COMPANY.
[Voladura de un tanque inglés delante de la linea más avanzada durante la batalla de Flandes, en 1917, por la Compania de Zapadores de Reserva No 52.]

July 1941

THE TRAINING OF THE HIGH COMMAND OF AN ARMY, AND THE TRAINING OF ARMY RESERVES.
[La instruccion de los cuadros superiores de un ejército y de sus reservas.] Brigadier General Jorge A. Giovaneli

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THE MOST FREQUENT ERRORS IN THE ANALYSIS OF SITUATIONS.
[Los errores más frecuentes en las apreciaciones de situacion.] Major R. E. Herrera

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THE REPRESENTATION OF TROOPS AND THEIR FIRE IN EXERCISES.
[La representacion de los fuegos en los ejercicios.] Lieutenant L. Boselli

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ANTIAIRCRAFT DEFENSE WITH INFANTRY UNITS.
[La defensa antiaérea en las unidades de infanteria.] Lieutenant J. L. D'Andrea Mohr

Annex to REVISTA MILITAR

V — 1941

FINAL EXERCISES, 1940
Report of Staff Exercises of Fifth Division

OBJECT OF THE EXERCISE AND SITUATION.
[Objeto del Ejercicio e Hipotesis de Guerra.]

SPECIAL ARRANGEMENTS FOR THE STAFF EXERCISES.
[Disposiciones Espaciales para el Ejercicio de Cuadros.]

INSTRUCTIONS TO UMPIRES AND PARTICIPANTS.
[Instrucciones a los árbitros y a los participantes.]

SEQUENCE OF EVENTS IN THE EXERCISES.
[Desarrollo del Ejercicio.]

DISCUSSION OF AND LESSONS LEARNED FROM THE EXERCISES.
[Critica y ensenanzas del Ejercicio.]

SUPPLEMENTARY MATERIAL.
[Anexos.]

REVUE MILITAIRE SUISSE (Switzerland)

March 1941

REFLECTIONS REGARDING THE FRENCH CAMPAIGN. POLICIES LEADING UP TO IT. THE ARMY AND POLICIES OF FRANCE ON THE EVE OF DEFEAT.
[Réflexions sur la campagne de France. Prémisses politiques. L'armée et la politique de la France à la veille de la défaite]. Captain E. Bauer

Article deals with the recent French defeat at the hands of the Germans and the causes — obligations to fulfill treaties, etc. — leading up to the war.

HOW TO INSTALL AN AUTOMATIC RIFLE FOR NIGHT SHOOTING.
[Comment fixer un F.M. en vue du tir de nuit.] Lieutenant Marc Tapernous

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A SPECIAL MANNER OF MOUNTING OUR HEAVY MACHINE GUN.
[Un cas particulier de mise en position de notre mitrailleuse lourde.] Captain Gallusser

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MOBILE ARMORED UNITS IN MOUNTAIN DEFENSE.
[Les cuirassements mobiles dans la défense en montagne.] Captain E. Moser

The article has reference to tanks of various sizes, either supplementing or taking the place of fixed and permanent fortifications.

April 1941

OPERATIONS ON THE WESTERN FRONT.
[Les opérations sur le front Ouest.] Lieutenant O. Jaggi

ANTITANK FIRE.
[Le tir contre chars.] Captain Jean Nicollin

MORALE OF TROOPS.
[Du moral de la troupe.] Lieutenant Paul Gaberell

May 1941

REFLECTIONS ON THE CAMPAIGN IN FRANCE.
[Réflexions sur la campagne de France.] (I) Captain E. Bauer

INSTRUCTION AND EDUCATION.
[Instruire-Eduquer.] Captain Verrey

COMMENTS ON THE PRESENT WAR.
[Commentaires sur la guerra actuelle.] (I)

June 1941

OIL AND WAR.
[Le pétrole et la guerre.] (I) By R

REFLECTIONS ON THE CAMPAIGN IN FRANCE.
[Réflexions sur la campagne de France.] (II) Captain E. Bauer

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COMMENTS ON THE PRESENT WAR. THE BATTLE OF CRETE.
[Commentaires sur la guerre actuelle.] (II)

July 1941

BREAKTHROUGH ACTION OF A GERMAN TANK REGIMENT REENFORCED BY MOTORIZED INFANTRY ON THE SOMME, 5-6 JUNE 1940.
[Manoeuvre de rupture d'un régiment allemand de chars renforcé d'infanterie motorisée, les 5 et 6 juin sur la Somme.] Lieut. Colonel Perret

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OIL AND WAR.
[Le pétrole et la guerre.] (II) By R

OFFICERS AND THEIR UNIFORMS.
[La tenue des officiers.] By R.V.

COMBAT INSTRUCTION IN THE TRAINING OF RECRUITS.
[L'instruction pour le combat à l'Ecole de recrues.] Lieutenant Reisser

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COMMENTS ON THE PRESENT WAR.
[Commentaires sur la guerre actuelle.] (III)

ROYAL AIR FORCE QUARTERLY (Great Britain)

March 1941

R.A.F. OPERATIONS IN THE WESTERN DESERT
R.A.F. OPERATIONS IN GREECE FROM 7TH NOVEMBER TO 21ST DECEMBER, INCLUSIVE
FLIGHT REFUELLING. Sir Alan J. Cobham
THE AIR WAR, 1940
BOMBS ON GERMANY

June 1941

ON ORGANIZATION. PARTS I AND II. Lieutenant Colonel E. G. Hart

ROYAL ENGINEERS JOURNAL (Great Britain)

June 1941

NOTES ON DEMOLITIONS CARRIED OUT IN A LARGE MANUFACTURING TOWN, AFTER A RECENT AIR RAID. By "Sap"
DIVISIONAL R.E. UNITS EQUIPMENT ON ACTIVE SERVICE: (A) THE FIELD COMPANY; (B) THE DIVISIONAL FIELD PARK COMPANY. By Captain R. T. Wiltshire and Major W. H. Aylwin
THE OIL SITUATION IN RUMANIA
WARTIME BUILDING. R. Fitzmaurice
THE RUSSO-TURKISH FRONTIER COMMISSION IN ASIA MINOR, 1857. By the Late Major-General E. Renouard James

THE TANK (Great Britain)

March 1941

THE OPERATIONS IN ITALIAN EAST AFRICA

April 1941

DEVELOPMENT OF THE GERMAN PANZER FORCE
WITH THE B.E.F. IN FLANDERS
TANK LESSONS FROM LIBYA
THE CONQUEST OF ITALIAN SOMALILAND

May 1941

GERMAN ARMOURED TROOPS

June 1941

THE BRITISH CAMPAIGN IN GREECE
THE PANZER DIVISIONS
THE SEA BATTLE

July 1941

THE OPERATIONS IN CRETE

VETERINARY BULLETIN
(Supplement to the Army Medical Bulletin)

April 1941

QUICK-FROZEN FOODS — FISH. Lieutenant Colonel H. E. Hess
ANIMAL CASUALTIES FROM CHEMICAL WARFARE AGENTS. Captain D. L. Mace
TRAINING OF THE REGIMENTAL VETERINARY SECTION. Captain J. M. Broadwell and Lieutenant C. W. Tate
PHYSICAL EXAMINATION OF DAIRY CATTLE. Lieutenant G. H. Zacherle, Jr.
MARCHING WITH CUSTER. Lieutenant Colonel E. L. Nye
WAR HORSE

July 1941

TERRITORIAL ANIMAL QUARANTINE STATION AND THE ARMY SECTION. Colonel J. M. Derrick, and Captain W. O. Kester
WESTERN SPREAD OF EASTERN TYPE EQUINE ENCEPHALOMYELITIS VIRUS. Lieut. Colonel R. Randall, and Lieutenant E. A. Eichorn
A METHOD OF DETERMINING THE INTERNAL TEMPERATURE AND RATE OF HEAT PENETRATION IN CANNED PRODUCTS DURING PROCESSING. Lieut. Colonel F. C. Waters
THE USE OF FILTERED BACTERIAL CULTURES (ANTIVIRUS-BESREDKA) IN VETERINARY MEDICINE. Major J. G. Townsend
ANOTHER PHASE OF ARMY VETERINARY SERVICE. Captain L. A. Hock
THE EVOLUTION OF THE HORSE. Captain R. A. Boyce
HORSE ACTIVITY IN HAWAII. Colonel J. D. Derrick, and Captain W. O. Kester
ANIMAL SEX CONTROL. Lieut. Colonel S. C. Smock

VOYENNIY VYESTNIK (Russia)

BY LIEUTENANT JOSEPH DASHER, O.R.C.

February 1941

THE ARMY OF THE SOCIALIST LAND.
[Armya Strany Sotsyalizma.]

The article — in reality a "pep talk" for the Soviet officer personnel — points out some of the general outlines of the reforms initiated by Marshal Semyon K. Timoshenko after the Russo-Finnish War.

Emphasis is placed on field training of troops under conditions approximating those of actual combat. Extensive training program for small units is strongly stressed.

SPECIAL ASPECTS IN THE ORGANIZATION OF THE MARCH AND ENCOUNTER COMBAT BY THE INFANTRY DIVISION IN THE WINTER.
[Osobennosti organizatsii marsha i vstryechnovo boya strelkovoy divizii zimoy.] Brigadier S. Luybarskiy

The march of the infantry division will depend on the nature of the winter and the depth of the snow, and may take place in marching order on skis or without them, or by motor vehicles.

Troops must be thoroughly trained for both day and night marches on skis. When the depth of snow will exceed 30 centimeters movement without skis will be difficult. Under those conditions horse-drawn artillery will use sleds.

Liberal employment of engineer units and mechanical snow removing equipment for the clearing of roads is recommended.

THE ORGANIZATION OF RECONNAISSANCE BY INFANTRY REGIMENT HEADQUARTERS.
[Organizatsya razvyedki shtabom stryelkovovo polka.] Lieut. Colonel A. Likhachev

Recommendations for the improvement of combat intelligence. The author believes prisoners should be questioned immediately after capture, when veracity of the information which can be extracted is most likely. S-2 journal forms are reviewed.

THE METHODS OF COMPILING A RECONNAISSANCE PLAN.
[Metodika sostavlenya razvyedyvatyelnoy skhemy.] Major A. Panyushkin

Technical methods of reproduction and distribution of reconnaissance reports, overlays, etc.

METHODS OF CONDUCTING INSTRUCTION OF OFFICERS.
[Metodika provedenya komandirskovo zanyatya.] Colonel A. Barmas

In outlining a general scheme of what should constitute an individual period of field instruction for officers, the author points out that modern warfare knows no "easy situations." Success is achieved only by stubborn and skillful conduct of battle. The Red Army officer must free himself from the formula of "I shall act in accordance with the situation." Combat must be studied thoroughly and profoundly.

The author discusses such subjects as size of group for instruction, nature and purpose of problems, troops needed for problem, time, terrain, place of instruction, season of the year, weather and critique.

THE ORGANIZATION OF INSTRUCTION FOR OBSERVERS IN SMALL INFANTRY AND HORSE CAVALRY UNITS.
[Organizatsya zanyatiy s nabluydatelyami melkikh podrazdeleniy pekhoty i konnitsy.] Lieut. General G. Morozov

The training of the cadre. Selection of terrain. Program of instruction. Selection of observers.

FLANK MACHINE GUN CURTAIN FIRE.
[Flangoviy zagraditelniy ogon' stankoviky pulemyotov.] Colonel V. Alekseyev

The objective of flank machine gun curtain fire is to stop the attacking enemy, forcing him to the ground, thus enabling all the defending agencies to concentrate their fire upon the enemy.

In modern defensive combat the flank machine gun curtain fire should be employed not only in front of the front line of resistance, but also in depth.

Flank machine gun curtain fire will be effective only if an impenetrable danger zone will be created thereby.

CROSSING OF ICE BY A LARGE CAVALRY UNIT.
[Preprava po ldu krupnovo soyedinenya konnitsy.] Major K. Stepanov

The article seems to be based on actual experience. After reviewing various operations, such as reinforcement of ice, the lighting of crossing places, telephone communications, cover for command posts and message centers, security of crossings, regulation of traffic, etc., the author draws the following conclusions:

(1) In the building of crossings over wide water barriers, the existing regulations in field manuals should be minutely observed.

(2) Loads should be reduced and distances between them should be made wider to prevent cracking of ice.

(3) The marching discipline should be based on data secured by ice reconnaissance, the nature of the loads and local meteorological conditions.

(4) The crossing places should be cleared by powerful mechanical means. The employment of means of locomotion having speed of less than 5 kilometers per hour is impractical. When sufficient quantity of machines of a speed higher than 5 kilometers per hour is available, troops can cross directly behind such machines, as the latter clear the crossing.

(5) In long crossings it it necessary to organize CP's at intervals, with telephones, and to employ other means of liaison.

(6) The technical direction of crossing of ice should be effected by units which have organized the crossing.

SKIRMISH TRENCHES IN CONTAMINATED AREA.
[O samookapyvanii na UZ.] Major N. Stolyarov

Individual entrenchment is rendered more difficult in chemically contaminated areas. While under normal conditions a soldier needs 8 to 12 minutes for effective entrenchment, in contaminated areas the required time will be 15 to 20 minutes.

WISSEN UND WEHR (Germany)

March 1941

THE ARMING OF HOSTILE MERCHANT SHIPS.
[Die Bewaffnung der feindlichen Handelsschiffe.] Dr. Ambrosius

In this article it is pointed out that German countermeasures are dictated by the necessities of war, in particular the immediate resort to the use of arms against armed ships; and, that these countermeasures are, therefore, in no wise to be regarded as an affront to the principles of international law.

April 1941

THE GERMAN WAR AGAINST ENCIRCLEMENT.
[Der deutsche Krieg gegen die Einkreisung.] Colonel R. von Xylander

May 1941

WAR AS VIEWED BY FRENCH AND BRITISH WRITERS.
[Der Krieg im Urteil des französischen und englischen Schriftums der letzten Vorkriegsjahre.] Major General E. Wagner

The author reviews the various views held by British and French military leaders with regard to the merits of the several defensive measures taken, as for example the construction of the Maginot Line. With respect to the latter, General Wagner concludes that the resisting strength of the Maginot Line was considerably overestimated. The entire war plan of the enemy, he declares, was based upon the invincibility of this line. Modern weapons contribute in greater measure toward a successful attack than they do toward defense, is the conclusion reached in this article. Or, writes the author, "it has been proved that a brave, well-armed and equipped army, particularly when under good leadership and having the proper spirit for attack, is capable of resisting even the strongest fortifications."

June 1941

MEMOIRS OF THE FRENCH EXPEDITION INTO EGYPT, 1798-1801.
[Erinnerungen an die französische Expedition nach Agypten 1798-1801.] Major General Otto Schulz

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SINGAPORE. HOW MUCH LONGER WILL IT BE AN ENGLISH STRONGHOLD IN THE FAR EAST?
[Singapore — wie lange noch englische Zwingburg in Fernost.] Hubert Zuerl

The author briefly sets forth the early history of Singapore's development into a fortified city. In passing, he also suggests that Japan and the United States have interests here, particularly as sources of rubber and tin from the Malay states.

★

General

FORTUNE

July 1941

SHIPS FOR THIS WAR.
To keep Britain afloat the U. S. will build 364 merchant ships this year and next. The problem: to increase our building capacity fourfold, train 450,000 shipyard workers.

SOVIET INDUSTRY.
A world at war speculates on the productive prowess of the U.S.S.R. What has it got? Plenty. How is it doing? So-so. Its most acute problem? To stay out of war.

GERMAN STRATEGY OF WORLD WAR II.
1. A Portfolio: Seven maps and captions show where the total war is being fought and where it is heading. A chart of fighting power indicates how long it may last.

2. America facing total war: The continent of Europe perished fighting wars of "limited liability" against all-out force. Must the U. S. smash power with superpower, carrying it beyond the Rhine?

PRELUDE TO TOTAL WAR.
Industrial democracy will survive only if it achieves total victory and aspires to a daring future.

August 1941

THIS WOULD BE VICTORY.
Whose revolution is it — Hitler's or ours? In the answer lies a great new vision of democracy. Russell W. Davenport

September 1941

THE ARMY OF THE REPUBLIC OF CHINA.
It is young, and strong, and resourceful, and well disciplined. It is — as only the invader fully understands after four years — AN ARMY.

THE UNBELIEVABLE BURMA ROAD.
The life of Free China literally hangs on the most dangerous (and beautiful) road in the world —"scratched out of the mountains with fingernails."

JAPAN-IN-CHINA.
Although her soldiers have kept their foothold on Chinese soil, Japan's economic offensive has failed colossally. She had nothing to sell but slavery.

AID TO CHINA — WHEN?
So little would mean so much to so many in fighting the Axis in the Far East; but the U. S. has yet to make up its mind to "stop Japan."

THE PARADOX OF OIL AND WAR.
Adolf Hitler has plenty of oil for lightning war, but only his enemies enough for peace.

SWITZERLAND SITS TIGHT.
Hemmed by the Axis powers, blockaded by the British, four million Swiss maintain the last stronghold of democracy on the Continent.

ILLUSTRATED LONDON NEWS (Great Britain)

26 April 1941

THE TRAINING OF A CAVALRYMAN (MODERN VERSION): CADETS WHO WILL BECOME LEADERS OF BRITAIN'S PANZER DIVISIONS. (Pictorial)
THE WAR WITH NAZI GERMANY: CLIMAX IN THE BALKANS. (With relief map to show strategic retreat of the Allies in the Battle of Greece.) Cyril Falls
DECIPHERING BLITZED DOCUMENTS: A NEW METHOD BY CHLORAL HYDRATE. (An explanation of how written and printed documents charred by Nazi fire and bombing raids are restored to legibility.)
A GERMAN PANZER DIVISION MOVES INTO ACTION: A PANORAMIC IMPRESSION, SHOWING MOTORCYCLES AND ARMORED CARS IN THE VAN, TANKS MOVING UP, WITH DIVE-BOMBERS ESCORT. (Pictorial)

17 May 1941

THE WAR WITH NAZI GERMANY: THE ARMY IN TRAINING. (This article deals with maneuvers to develop anti-invasion methods.) Cyril Falls
THE FIRST TANK BATTLE IN HISTORY. (A graphic description by a German tank officer who took part in the fight in May 1940, after the Germans crossed the frontiers of Holland and Belgium, culminating on 13 May in a critical clash between German and French tanks. Includes illustrative sketches of German light, medium and heavy-medium tanks.)

31 May 1941

THE EPIC EVACUATION FROM GREECE: DAUNTLESS BRITISH FORCES. (Pictorial)
WINGED INVADERS OF CRETE: DETAILS OF TROOP-CARRYING GLIDERS. (Pictorial)
WAR IN THE STRATOSPHERE: SOME PROBLEMS PRESENTED BY THE ENIGMA OF FLIGHT MILES ABOVE THE EARTH. (Pictorial)
THE WAR WITH NAZI GERMANY: THE BATTLE FOR CRETE. Cyril Falls

7 June 1941

AIRCRAFT AND SEA WARFARE: THE INFLUENCE OF AEROPLANES ON WARSHIP CONSTRUCTION AND NAVAL STRATEGY. (Pictorial)
THE WAR WITH NAZI GERMANY: THE FLEET AND ITS AIR ARM. Cyril Falls

21 June 1941

THE WAR WITH NAZI GERMANY: PLANNING FOR VICTORY. Cyril Falls
THE LINK BETWEEN ARMY AND AIR CO-OPERATION IN ACTION: MOBILE H.Q. OF AN ARMY-AIR INTELLIGENCE LIAISON OFFICER. (Pictorial)

28 June 1941

THE WAR WITH NAZI GERMANY: TANK FIGHTING. Cyril Falls
THE FURIOUS SPEED OF MODERN WARFARE: INTERIOR OF THE MOBILE HEADQUARTERS OF A FAST TANK DIVISION. (Pictorial)

LIBERTY

2 August 1941

CAMP MORALE — WHAT GOES ON? Morris Markey

LIFE

4 August 1941

AMERICA BARES ITS WEAPONS OF ATTACK AS THE TIME FOR ACTION DRAWS NEARER
SOLDIERS AND MARINES CAPTURE A DESERTED BEACH
A GERMAN CAMOUFLAGE TRICK

NATIONAL GEOGRAPHIC MAGAZINE

July 1941

NEWFOUNDLAND, NORTH ATLANTIC RAMPART. (With 26 illustrations and map) George Whiteley, Jr.

PROCEEDINGS OF THE ACADEMY OF POLITICAL SCIENCE

May 1941

ARMY DEVELOPMENTS IN PREPAREDNESS. Major General Robert C. Richardson, Jr.
DEFENSE IN TWO OCEANS. George Fielding Eliot

ROUND TABLE (Great Britain)

June 1941

(Seventh War Number)

THE RIDDLE OF 1941
THE STRATEGY OF THE WAR. VII
YUGOSLAVIA — THE TRAGEDY OF HONOUR
AMERICA'S GATHERING STRENGTH

U. S. AIR SERVICES

July 1941

MIGHTY "WINGED ARMY" THE GOAL FOR AMERICA. Major Frank L. Nelson
B-19 — GUARDIAN OF A HEMISPHERE

"For anyone who aspires to become a great commander, there is an open book, called military history, which begins with the hand-to-hand struggle between Cain and Abel and which did not end with Napoleonic Campaigns.

"Its reading, I must admit, is not always exciting. One has to plow through a mass of uninteresting details! But—one accumulates facts, often encouraging facts! and at the bottom of it all, one arrives at the final realization how it all came about, how it had to happen and may happen again."—von Schlieffen.

Subject Index

LIST OF PERIODICALS INDEXED AND KEY TO ABBREVIATIONS

Aero = Aeroplane (Great Britain)

A Med Bul = Army Medical Bulletin

A Ord = Army Ordnance

A Quar = Army Quarterly (Great Britain)

Cav Jour = Cavalry Journal

Chem War Bul = Chemical Warfare Bulletin

CA Jour = Coast Artillery Journal

Ejercito = Ejercito (Spain)

FA Jour = Field Artillery Journal

Ftg Forc = Fighting Forces (Great Britain)

Inf Jour = Infantry Journal

Jour RAMC = Journal of the Royal Army Medical Corps (Great Britain)

Jour R Art = Journal of the Royal Artillery (Great Britain)

Jour RUSI = Journal of the Royal United Service Institution (Great Britain)

MC Gaz = Marine Corps Gazette

Mil Mitt = Militärwissenschaftliche Mitteilungen (Austria)

Mil Rund = Militärwissenschaftliche Rundschau (Germany)

Mil-Woch = Militär-Wochenblatt (Germany)

Mil Af = Military Affairs (Jour. American Military Institute)

Mil Eng = Military Engineer

Mil Surg = Military Surgeon

Nav Inst Proc = Naval Institute Proceedings

Our Army = Our Army

Panzer = Die Panzertruppe (Germany)

QM Rev = Quartermaster Review

Rec News = Recruiting News

Res Off = Reserve Officer

Rev Mil = Revista Militar (Argentina)

Rv Mil Suisse = Revue Militaire Suisse (Switzerland)

RAF Quar = Royal Air Force Quarterly (Great Britain)

Roy Eng Jour = Royal Engineers Journal (Great Britain)

Tank = The Tank (Great Britain)

Vet Bul = Veterinary Bulletin

Voy Vy = Voyenniy Vyestnik (Russia)

Ws & Wr = Wissen und Wehr (Germany)

GENERAL

Fortune = Fortune

Ill Lon News = Illustrated London News (Great Britain)

Liberty = Liberty

Life = Life

Nat Geog = National Geographic Magazine

Proc Pol Sci = Proceedings of the Academy of Political Science

Round Table = Round Table (Great Britain)

U. S. Air Services = U. S. Air Services

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A

AIR ARM

Organization and Equipment

Air transport by gliders. (Aero — 25 Apr 1941)
"New worlds for old." (Aero — 9 May 1941)
Modern cockpit controls and equipment. (Aero — 9 May 1941)
Taking out the "static." (Aero — 16 May 1941)
Holding up the army's umbrella. (Aero — 30 May 1941)
Aeronautical engineering — Fascist fashions. (Aero — 20 Jun 1941)
Enter the barrage balloon. (CA Jour — Jul-Aug 1941)
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What use is the helicopter? (Inf Jour — Jul 1941)
Prefabricated wood hangars. (Mil Eng — Jul-Aug 1941)
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Aircraft and sea warfare. (Ill Lon News — 7 Jun 1941)
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B-19 — Guardian of a hemisphere. (U. S. Air Services — Jul 1941)

Training Tactics

Air transport by gliders. (Aero — 25 Apr 1941)
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Invasion by air. (Aero — 30 May 1941)
Conquest by air bombardment. (Aero — 6 Jun 1941)
The war in the air. (Aero — 6 Jun 1941)
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The army and air power. (Aero — 30 Jun 1941)
Air power and coast defense. (A Ord — Sep-Oct 1941)
Air force in support of ground forces. (Cav Jour — Jul-Aug 1941)
Air-borne field artillery. (FA Jour — Jul 1941)
Artillery and bombing planes. (FA Jour — Aug 1941)
Can bombing win a war? (Ftg Forc — Jun 1941)
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AIR POWER

"New worlds for old." (Aero — 9 May 1941)
The air challenge to sea power. (Aero — 16 May 1941)
Air power is sea power. (Nav Inst Proc — Jul 1941)

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A job for fighters. (Aero — 9 May 1941)
Air raids and protective construction. (Mil Eng — Jul-Aug 1941)

AIR RAID WARNING SERVICE

Blackouts. (Mil Eng — May-Jun 1941)

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The battle of Crete. [See "Foreign Military Digests" section]
Hit where it hurts most. [See "Foreign Military Digests" section]
War in the stratosphere. (Ill Lon News — 31 May 1941)
Aircraft and sea warfare. (Ill Lon News — 7 Jun 1941)
The war with Nazi Germany. (Ill Lon News — 7 Jun 1941)
Rifle fire against aircraft. [See "Foreign Military Digests" section]

AIRPORTS

Inspection of the Washington National Airport. (Mil Eng — Jul-Aug 1941)

AIRWAYS (COMMERCIAL)

The air transport industry in the national defense. (Mil Eng — May-Jun 1941)

ALASKA

The Aleutians — their strategic importance. (Nav Inst Proc — Jun 1941)

ALEUTIAN ISLANDS

The Aleutians — their strategic importance. (Nav Inst Proc — Jun 1941)

AMMUNITION

Ammunition at the front. (A Ord — Sep-Oct 1941)
Device for measuring powder temperature. (FA Jour — Jun 1941)
Pyrotechnics as an aid to the forward observer. (FA Jour — Aug 1941)
Air raids and protective construction. (Mil Eng — Jul-Aug 1941)
Atmosphere of the battlefield. [See "Foreign Military Digests" section]

ANIMALS

How much should army draft horses weigh? (Mil-Woch — 18 Jul 1941)

ANTIAIRCRAFT ARTILLERY

Umpiring for AAA. (CA Jour — May-Jun 1941)
Tactical training of AAA in the Third Army. (CA Jour — May-Jun 1941)
Shell burst projector and spotting trainer. (CA Jour — May-Jun 1941)
Antiaircraft batteries. (Ejercito — May 1941)
Notes on German artillery organization and equipment. (Jour R Art — Apr 1941)
Antiaircraft in the World War. (Mil-Woch — 30 May, 6 Jun 1941)
The air war, 1940. (RAF Quar — Mar 1941)

ANTIAIRCRAFT DEFENSE

Enter the barrage balloon. (CA Jour — Jul-Aug 1941)
Antiaircraft defense. (Ejercito — Mar 1941)
Antiaircraft defense with infantry units. (Rev Mil — Jul 1941)
Rifle fire against aircraft. [See "Foreign Military Digests" section]

ANTITANK

The protection of mechanical transport against A.F.Vs. (Armoured cars) in the back areas. (A Quar — Jul 1941)
Antitank corps. (Cav Jour — May-Jun 1941)
Antitank defense. (Ejercito — Feb 1941)
Antitank fire with minus site. (FA Jour — Jun 1941)
Technique and drill of the 75-mm antitank battery. (FA Jour — Jul 1941)
Armored attack south of A..... (FA Jour — Aug 1941)
So the tanks will come. (Res Off — Jul 1941)
Antitank fire. (Rv Mil Suisse — Apr 1941)
Development of the German panzer force. (Tank — Apr 1941)
A tank platoon in battle against a hostile tank platoon. [See page 30]
Antimechanized defense. [See page 34]

The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]

ARABIA

The natural resources of Egypt and Arabia. (Mil-Woch — 6 Jun 1941)

ARGENTINA (ARMY OF)

The training of the high command of an army, and the training of army reserves. (Rev Mil — Jul 1941)
The representation of troops and their fire in exercises. (Rev Mil — Jul 1941)
Report of staff exercises of the Fifth Division, 1940. (Rev Mil — Annex V-1941)

ARMAMENT

Armament engineering. (A Ord — Jul-Aug 1941)
Planned munitions. (A Ord — Jul-Aug 1941)

ARMORED FORCES

Our new medium tank. (A Ord — Jul-Aug 1941)
The modern scout car. (A Ord — Jul-Aug 1941)
Half-tracks for mobility. (A Ord — Sep-Oct 1941)
The protection of mechanical transport against A.F.Vs. (Armoured cars) in the back areas. (A Quar — Jul 1941)
Antitank corps. (Cav Jour — May-Jun 1941)
The armored force: Reconnaissance battalion, armored division. (Cav Jour — May-Jun 1941)
Air force in support of ground forces. (Cav Jour— Jul-Aug 1941)
Incidents from the Battle of France. (FA Jour — Jun 1941)
Fighting the panzers. (FA Jour — Aug 1941)
Armored attack south of A..... (FA Jour — Aug 1941)
Armored field artillery in the Tennessee maneuvers. (FA Jour — Sep 1941)
Army and super-army. (Inf Jour — Aug 1941)
Armored attack. (Our Army — Jul 1941)
Status of the armored force. (Res Off — Aug 1941)
Mobile armored units in mountain defense. (Rv Mil Suisse — Mar 1941)
Development of the German panzer force. (Tank — Apr 1941)
Tank lessons from Libya. (Tank — Apr 1941)
German armoured troops. (Tank — May 1941)
The panzer divisions. (Tank — Jun 1941)
The training of a cavalryman (modern version). (Ill Lon News — 26 Apr 1941)
A German panzer division moves into action. (Ill Lon News — 26 Apr 1941)
The first tank battle in history. (Ill Lon News — 17 May 1941)
The link between army and air co-operation in action. (Ill Lon News — 21 Jun 1941)
The war with Nazi Germany. (Ill Lon News — 28 Jun 1941)
The furious speed of modern warfare. (Ill Lon News — 28 Jun 1941)
The brunt of the battle. [See page 17]
Armored armies. [See page 20]
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Mobile armored units in mountain defense. [See "Foreign Military Digests" section]
The panzer division. [See "Foreign Military Digests" section]
German armored troops. [See "Foreign Military Digests" section]

ART OF WAR STRATEGY

Air power and coast defense. (A Ord — Sep-Oct 1941)
Command — Training the mind's eye. (A Quar — Jul 1941)
Xenophon's treatise on cavalry — still sound in principle. (Cav Jour — Jul-Aug 1941)
Military progress. (FA Jour — Jun 1941)
Invasion of England — A preview. (FA Jour — Jul 1941)
Artillery and bombing planes. (FA Jour — Aug 1941)
With the armies of foreign nations: a lesson from the conduct of war in North Africa. (FA Jour — Aug 1941)
An amateur's first attempt at strategy. (FA Jour — Sep 1941)
Armored field artillery in the Tennessee maneuvers. (FA Jour — Sep 1941)
Twentieth-century irregulars. (Inf Jour — Jun 1941)
Counterbreakthrough. (Inf Jour — Jul, Aug, Sep 1941)
Army and super-army. (Inf Jour — Aug 1941)
Men, fear and panic. (Inf Jour — Sep 1941)
"German Psychological Warfare." (Inf Jour — Sep 1941)
"There is nothing new under the sun." (QM Rev — May-Jun 1941)
The most frequent errors in the analysis of situations. (Rev Mil — Jul 1941)
The representation of troops and their fire in exercises. (Rev Mil — Jul 1941)
War as viewed by French and British writers. (Ws & Wr — May 1941)
The furious speed of modern warfare. (Ill Lon News — 28 Jun 1941)
The strategy of the War. (Round Table — Jun 1941)
Assault of fortified positions. [See page 12]
The brunt of the battle. [See page 17]
Armored armies. [See page 20]
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Progressive training of officers. [See page 41]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]
New aspects of the war in the west. [See "Foreign Military Digests" section]
Mobile armored units in mountain defense. [See "Foreign Military Digests" section]
Reconnaissance. [See "Foreign Military Digests" section]
The panzer divisions. [See "Foreign Military Digests" section]
The motorized division. [See "Foreign Military Digests" section]
Rifle fire against aircraft. [See "Foreign Military Digests" section]
Russian air power — the strategic plan. [See "Foreign Military Digests" section]

ARTILLERY

History

The history and traditions of the Royal Artillery. (Jour R Art — Apr 1941)

Organization and Equipment

Railway artillery. An outmoded element of our seacoast defense? (A Ord — Jul-Aug 1941)
German horse cavalry. Artillery for the fast units. (Cav Jour — May-Jun 1941)
The story of artillery through the ages. (CA Jour — Jul-Aug 1941)
Motorized artillery. (Ejercito — Feb 1941)
Artillery information service. (Ejercito — Apr 1941)
Division artillery. (Ejercito — Jul 1941)
Device for measuring powder temperature. (FA Jour — Jun 1941)
Self-propelled artillery. (FA Jour — Jun 1941)
The Red artillery. (FA Jour — Jul 1941)
An emplacement for the 75-mm. M2. (FA Jour — Jul 1941)
Artillerymen without guns. (FA Jour — Jul 1941)
Fire power. (FA Jour — Aug 1941)
Field artillery — 1941. (FA Jour — Sep 1941)
Notes on German artillery organization and equipment. (Jour R Art — Apr 1941)
Information service of the artillery. (Rev Mil — May 1941)
Topographic bases for the artillery. (Rev Mil — Jun 1941)
Communications platoon of the artillery. (Rev Mil — Jun 1941)

Supply

Loading of field artillery materiel for railway transport. (FA Jour — Jun 1941)

Training Tactics

Supporting artillery. (Ejercito — Jan 1941)
Artillery. The group in combat. (Ejercito — Feb 1941)
Firing discipline. (Ejercito — Apr 1941)
Artillery observation. (Ejercito — Apr 1941)
Direction of artillery fire. (Ejercito — Jun 1941)
Antitank fire with minus site. (FA Jour — Jun 1941)
Two replacement centers. (FA Jour — Jun 1941)
Marking artillery fires. (FA Jour — Jun 1941)
An artillery action in Somaliland. (FA Jour — Jun 1941)
Quick! Where am I? (FA Jour — Jun 1941)
The automotive driver. (FA Jour — Jun 1941)
Artillery in direct support of tanks. (FA Jour — Jun 1941)
A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
Air-borne field artillery. (FA Jour — Jul 1941)
The forward observer. (FA Jour — Jul 1941)
Technique and drill of the 75-mm antitank battery. (FA Jour — Jul 1941)
An emplacement for the 75-mm. M2. (FA Jour — Jul 1941)
Strictly according to the book. (FA Jour — Jul 1941)
Coupling. (FA Jour — Jul 1941)
Conduct of fire. (FA Jour — Jul 1941)
Notes on liaison. (FA Jour — Jul 1941)
Artillerymen without guns. (FA Jour — Jul 1941)
Artillery and bombing planes. (FA Jour — Aug 1941)
Advanced course (special) Number Two. (FA Jour — Aug 1941)
The fall of Belgium. (FA Jour — Aug 1941)
Moving targets on sunken track ranges. (FA Jour — Aug 1941)
Pyrotechnics as an aid to the forward observer. (FA Jour — Aug 1941)
Fire power. (FA Jour — Aug 1941)
Artillery observation. (FA Jour — Aug 1941)
Campaign in Flanders, 1940. (FA Jour — Sep 1941)
Field Artillery — 1941. (FA Jour — Sep 1941)
Mountain divisions in blitzkrieg. (FA Jour — Sep 1941)
Subcaliber. (FA Jour — Sep 1941)
Incidents from the War: Experiences of a Dutch artillery detachment during the invasion of Holland. (FA Jour — Sep 1941)
Artillery in the Russo-German War. (FA Jour — Sep 1941)
Armored field artillery in the Tennessee maneuvers. (FA Jour — Sep 1941)
The war in the Crimea. 1854. (Jour R Art — Apr 1941)
Services of a group of light artillery during an offensive. (Rev Mil — Apr 1941)
The brunt of the battle. [See page 17]
Artillery helps itself. [See "Foreign Military Digests" section]
Artillery liaison detail with a tank battalion. [See "Foreign Military Digests" section]

Weapons

Wartime production. (FA Jour — Jun, Jul, Aug 1941)
The 105-mm howitzer. (Inf Jour — Aug 1941)

ATTACK

The fall of Belgium. (FA Jour — Jun 1941)
German assaults upon permanent fortifications. (FA Jour — Jun 1941)
Invasion of England — A preview. (FA Jour — Jul 1941)
A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
Armored attack. (Our Army — Jul 1941)

AVIATION (MARINE)

Marine Corps aviation. (MC Gaz — Jun 1941)

B

BARRAGE BALLOONS

Enter the barrage balloon. (CA Jour — Jul-Aug 1941)
Balloon barrage. (Res Off — Aug 1941)

BLACKOUTS

Blackouts. (Mil Eng — May-Jun 1941)

BOLIVIA

Bolivia and the Arica-Santos Railway. (Mil Eng — Jul-Aug 1941)

BOMB SHELTERS

Bomb shelters. (Ejercito — Jun 1941)
Air raids and protective construction. (Mil Eng — Jul-Aug 1941)

BREAKTHROUGH OPERATIONS

Counterbreakthrough. (Inf Jour — Jul, Aug, Sep 1941)
Breakthrough on the Somme. (Inf Jour — Sep 1941)
The French defense against the German breakthrough across the Meuse between Sedan and Namur in May 1940. (Mil Rund — Jun 1941)
The French version of the breakthrough at the Meuse. (Mil-Woch — 11, 18 Jul 1941)
Breakthrough action of a German tank regiment reinforced by motorized infantry on the Somme, 5-6 June 1940. (Rv Mil Suisse — Jul 1941)
The brunt of the battle. [See page 17]
The German breakthrough into Greece. [See "Foreign Military Digests" section]

BRIDGEHEADS

The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]

C

CAMOUFLAGE

Motorcycle platoon in dismounted attack. (Cav Jour — Jul-Aug 1941)
Military oil storage. (Mil Eng — May-Jun 1941)
A German camouflage trick. (Life — 4 Aug 1941)

CANADA (ARMY OF)

The maple leaf forever. (FA Jour — Sep 1941)

CARIBBEAN, The

The Caribbean — an American lake. (Nav Inst Proc — Jul 1941)

CAVALRY

Organization and Equipment

Mountain troops. (Cav Jour — May-Jun 1941)
Rubber tires, cavalry. (Cav Jour — May-Jun 1941)
Cavalry replacement training center. (Cav Jour — May-Jun 1941)
Cavalry bridge requirements and the cable bridge. (Cav Jour — May-Jun 1941)
Scout car — horse portée action in the prompt reduction of road blocks. (Cav Jour — May-Jun 1941)
Feeding and care of horses. (Cav Jour — May-Jun 1941)
Mounting trooper's individual equipment on solo motorcycle. (Cav Jour — May-Jun 1941)
German horse cavalry. (Cav Jour — May-Jun 1941)
Second Cavalry Division comes to life. (Cav Jour — Jul-Aug 1941)
The engineers, First Cavalry Division. (Cav Jour — Jul-Aug 1941)
Triangular division today. (Cav Jour — Jul-Aug 1941)
C.R.T.C. at end of first cycle. (Cav Jour — Jul-Aug 1941)
Cavalry snow trooping (H & M). (Cav Jour — Jul-Aug 1941)
Radio equipment for horse cavalry. (Cav Jour — Jul-Aug 1941)
With the other arms and services: Cavalry. (FA Jour — Aug 1941)
Army cavalry. (Rev Mil — Apr 1941)
Marching with Custer. (Vet Bul — Apr 1941)
War horse. (Vet Bul — Apr 1941)
The cavalry regiment (horse and mechanized). [See page 25]

Supply

Field supply of a cavalry regiment (H & M). (Cav Jour — May-Jun 1941)
Supply of a horse regiment. (Cav Jour — May-Jun, Jul-Aug 1941)

Training Tactics

U.S. horse cavalry girds for war. (Cav Jour — May-Jun 1941)
Scout car — horse portée action in the prompt reduction of road blocks. (Cav Jour — May-Jun 1941)
The selectee slant! (Cav Jour — May-Jun 1941)
Cavalry medical problems. (Cav Jour — May-Jun 1941)
Noncom quiz. (Cav Jour — May-Jun 1941)
Air force in support of ground forces. (Cav Jour — Jul-Aug 1941)
Second Cavalry Division comes to life. (Cav Jour — Jul-Aug 1941)
Xenophon's treatise on cavalry — still sound in principle. (Cav Jour — Jul-Aug 1941)
Cavalry swims full pack. (Cav Jour — Jul-Aug 1941)
Portable boat for stream crossing. (Cav Jour — Jul-Aug 1941)
C.R.T.C. at end of first cycle. (Cav Jour — Jul-Aug 1941)
Cavalry snow trooping (H & M). (Cav Jour — Jul-Aug 1941)
Horse cavalry regiment (reinforced) prepares to meet a mechanized attack. (Cav Jour — Jul-Aug 1941)
Cavalry camouflage. (Cav Jour — Jul-Aug 1941)
Motorcycle platoon in dismounted attack. (Cav Jour — Jul-Aug 1941)
With the other arms and services: cavalry. (FA Jour — Aug 1941)
Marching with Custer. (Vet Bul — Apr 1941)
The organization of instruction for observers in small infantry and horse cavalry units. (Voy Vy — Feb 1941)
Crossing of ice by a large cavalry unit. (Voy Vy — Feb 1941)
The training of a cavalryman (modern version). (Ill Lon News — 26 Apr 1941)
The cavalry regiment (horse and mechanized). [See page 25]
The cavalry reconnaissance detachment of the 46th Division in the drive against Blangy on 6 June. [See "Foreign Military Digests" section]

CHEMICAL SERVICE

Total fire. (Chem War Bul — Jul 1941)
Training aids. (Chem War Bul — Jul 1941)
Fire from incendiary bombs. (Chem War Bul — Jul 1941)
Odor identification of chemical warfare agents. (Chem War Bul — Jul 1941)
Training films and film strips. (Chem War Bul — Jul 1941)
A portable gas chamber. (Chem War Bul — Jul 1941)
The chemical branch of the army. (Ejercito — Mar 1941)
Animal casualties from chemical warfare agents. (Mil Surg — Aug 1941)
Protection against chemical warfare. (Res Off — Aug 1941)

Tactics of chemical warfare. (Rev Mil — May 1941)
Animal casualties from chemical warfare agents. (Vet Bul — Apr 1941)
Skirmish trenches in contaminated area. (Voy Vy — Feb 1941)

CHILE

Chile. (Nav Inst Proc — Jun 1941)

CHINA

Some experiences in Free China. (MC Gaz — Jun 1941)
The unbelievable Burma Road. (Fortune — Sep 1941)
Aid to China — When? (Fortune — Sep 1941)

CHINA (ARMY OF)

The Army of the Republic of China. (Fortune — Sep 1941)

CIVILIAN CONSERVATION CORPS

Some eye, ear, nose and throat findings in men being examined for enrollment in the Civilian Conservation Corps. (Mil Surg — Jul 1941)

COAST ARTILLERY

Railway artillery. An outmoded element of our seacoast defense? (A Ord — Jul-Aug 1941)
Umpiring for AAA. (CA Jour — May-Jun 1941)
The floating fortress. (CA Jour — May-Jun 1941)
Tactical training of AAA in the Third Army. (CA Jour — May-Jun 1941)
Standing operating procedure. (CA Jour — May-Jun 1941)
Shell burst projector and spotting trainer. (CA Jour — May-Jun 1941)
Range percentage spotting board. (CA Jour — May-Jun 1941)
Enter the barrage balloon. (CA Jour — Jul-Aug 1941)
Fire control equipment for seacoast artillery. (CA Jour — Jul-Aug 1941)
The story of artillery through the ages. (CA Jour — Jul-Aug 1941)
Balloon barrage. (Res Off — Aug 1941)

COAST DEFENSE

Railway artillery. An outmoded element of our seacoast defense? (A Ord — Jul-Aug 1941)
Air power and coast defense. (A Ord — Sep-Oct 1941)
Coast batteries. (Ejercito — Apr 1941)
Coast defense. Illumination. (Ejercito — Jun 1941)

COAST GUARD (US)

The Coast Guard as a naval asset. (Nav Inst Proc — Jul 1941)

COLOMBIA

Colombia. (Nav Inst Proc — Jul 1941)

COLONIZATION

The soldier as Empire builder. (A Quar — Jul 1941)

COMMAND, STAFF, AND LOGISTICS

Command — Training the mind's eye. (A Quar — Jul 1941)
Field supply of a cavalry regiment (H & M). (Cav Jour — May-Jun 1941)
Supply of a horse regiment. (Cav Jour — May-Jun 1941)
Standing operating procedure. (CA Jour — May-Jun 1941)
From the Chief's Office: The Service Company. (Inf Jour — Jul 1941)
Musings on medical evacuation in mobile warfare. (Jour RAMC — Apr 1941)
The high command of armed forces. (Rev Mil — Jun 1941)
The training of the high command of an army, and the training of army reserves. (Rev Mil — Jul 1941)
S O P intelligence. [See page 38]
Progressive training of officers. [See page 41]

CONVOYS (LAND)

Vehicle spacing in motor columns. (Inf Jour — Aug 1941)
Thirty-one hundred miles with the First Medical Regiment. (Mil Surg — Jun 1941)

COUNTERATTACK

A successful defense against an air-borne invasion. (FA Jour — Jul 1941)

COUNTERBREAKTHROUGH

Counterbreakthrough. (Inf Jour — Jul, Aug, Sep 1941)

CRYPTOGRAPHY

Coding coordinates. (Inf Jour — Aug 1941)

D

DEMOCRACY

The influence of democracy upon sea power. (Nav Inst Proc — Jun 1941)
Prelude to total war. (Fortune — Jul 1941)
This would be victory. (Fortune — Aug 1941)

DEMOLITIONS

Notes on demolitions carried out in a large manufacturing town, after a recent air raid. (Roy Eng Jour — Jun 1941)
The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]

DISCIPLINE

"Moral" in the War 1914-1918. (A Quar — Jul 1941)
The company commander. [See page 5]
Discipline "new style" in the German Army. [See page 29]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]

E

ECONOMICS

The economics of war. (Ejercito — Jan, Jun 1941)
Money, production, and time. (Inf Jour — Jun 1941)

ECUADOR

Ecuador. (Nav Inst Proc — Aug 1941)

EGYPT

Natural resources of Egypt and Arabia. (Mil-Woch — 6 Jun 1941)

ENGINEERS

Cavalry bridge requirements and the cable bridge. (Cav Jour — May-Jun 1941)
Permanent fortifications. (Ejercito — Jan 1941)
Assault engineers. (Ejercito — Feb 1941)
Bridges built by engineers. (Ejercito — Mar 1941)
Mountain topography in our war. (Ejercito — Mar 1941)
Permanent lines of fortification. (Ejercito — May 1941)
The "Red" engineer troops at the Ebro. (Ejercito — Jul 1941)
With the other arms and services: I — Engineers. (FA Jour — Jun 1941)
Paperwork by camera. (Inf Jour — Jun 1941)
Blackouts. (Mil Eng — May-Jun 1941)
Barrier tactics. (Mil Eng — May-Jun 1941)
Modern military obstacle technique. (Mil Eng — May-Jun 1941)
Gulf coast waterways. (Mil Eng — May-Jun 1941)
Engineers in battle. (Mil Eng — May-Jun, Jul-Aug 1941)
New portable timber military bridge. (Mil Eng — May-Jun 1941)
Construction of a semi-permanent camp at Fort Buchanan, Puerto Rico. (Mil Eng — May-Jun 1941)
Construction of the Puerto Rican general depot. (Mil Eng — May-Jun 1941)
Emergency ponton bridge at Hidalgo, Texas. (Mil Eng — May-Jun 1941)
Developments in design of ponton bridges. (Mil Eng — May-Jun 1941)
Military engineers today. (Mil Eng — Jul-Aug 1941)
Military obstacle course. (Mil Eng — Jul-Aug 1941)
Inspection of the Washington National Airport. (Mil Eng — Jul-Aug 1941)
Air raids and protective construction. (Mil Eng — Jul-Aug 1941)
Prefabricated wood hangars. (Mil Eng — Jul-Aug 1941)
The Upper Mississippi River project. (Mil Eng — Jul-Aug 1941)
Military bridges and bridging. (Mil Eng — Jul-Aug 1941)
Rubber in the national defense. (Mil Eng — Jul-Aug 1941)
The "Undiscouraged Engineers"; the 24th Engineer Battalion at the crossing of the Marne in July 1918. (Rev Mil — Apr 1941)
The blowing up of an English tank in front of the most advanced lines during the battle of Flanders by the 52d Reserve Engineers Company. (Rev Mil — Jun 1941)
Notes on demolitions carried out in a large manufacturing town, after a recent air raid. (Roy Eng Jour — Jun 1941)
Divisional R.E. units equipment on active service. (Roy Eng Jour — Jun 1941)
Wartime building. (Roy Eng Jour — Jun 1941)
Assault of fortified positions. [See page 12]
The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]
German advance guard in action — crossing the Seine. [See "Foreign Military Digests" section]

F

FORTIFICATIONS

Permanent fortifications. (Ejercito — Jan 1941)
Permanent lines of fortification. (Ejercito — May 1941)
How Eben Emael was taken. (FA Jour — Jun 1941)
German assaults upon permanent fortifications. (FA Jour — Jun 1941)
The assault on the Maginot Line. (Panzer — Apr 1941)
War as viewed by French and British writers. (Ws & Wr — May 1941)
Assault of fortified positions. [See page 12]

FRANCE (ARMY OF)

The Germans, Spaniards and French as soldiers. (Mil-Woch — 23 May 1941)
Regarding the French army. (Rev Mil — Apr, May 1941)
Reflections regarding the French campaign. (Rv Mil Suisse — Mar 1941)

G

GEOGRAPHY (MILITARY)

Military geography of the Near East. (Inf Jour — Jul 1941)

GERMANY

Hitler or Prussia? (Ftg Forc — Aug 1941)

GERMANY (ARMY OF)

Organization and Equipment

Mountain troops. (Cav Jour — May-Jun 1941)
German horse cavalry. Artillery for the fast units. (Cav Jour — May-Jun 1941)
The secret German weapon. (FA Jour — Jun 1941)
German signal communications. (FA Jour — Aug 1941)
Artillery observation. (FA Jour — Aug 1941)
International Military Survey: A private's view of the German Army. (Inf Jour — Jun 1941)
Notes on German artillery organization and equipment. (Jour R Art — Apr 1941)
The spirit of the German soldier. (Mil-Woch — 18 Apr 1941)
German army motor transportation. (QM Rev — May-Jun 1941)
Driving in column and leading one. (QM Rev — May-Jun 1941)
Material of ponton bridges in the German army. (Rev Mil — Apr 1941)
Development of the German panzer force. (Tank — Apr 1941)
German armoured troops. (Tank — May 1941)
The panzer divisions. (Tank — Jun 1941)
The company commander. [See page 5]
Armored armies. [See page 20]
Artillery helps itself. [See "Foreign Military Digests" section]
German armored troops. [See "Foreign Military Digests" section]

Training

The "why" of German victories. (Ejercito — Jul 1941)
German assaults upon permanent fortifications. (FA Jour — Jun 1941)
The secret German weapon. (FA Jour — Jun 1941)
Strictly according to the book. (FA Jour — Jul 1941)
Artillerymen without guns. (FA Jour — Jul 1941)
Mountain divisions in blitzkrieg. (FA Jour — Sep 1941)
"German Psychological Warfare." (Inf Jour — Sep 1941)
The Germans, Spaniards and French as soldiers. (Mil-Woch — 23 May 1941)
The technique of a lecture. (Panzer — Jun 1941)
Gliders for national defense. (Res Off — Jul 1941)
Tactical problem. (Rev Mil — Apr, Jun 1941)
A German panzer division moves into action. (Ill Lon News — 26 Apr 1941)
A German camouflage trick. (Life — 4 Aug 1941)
Armored infantry in action. [See page 23]
Discipline "new style" in the German army. [See page 29]
Progressive training of officers. [See page 41]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]
The atmosphere of the battlefield. [See "Foreign Military Digests" section]
Infantry — a commentary. [See "Foreign Military Digests" section]
Artillery helps itself. [See "Foreign Military Digests" section]
Artillery liaison detail with a tank battalion. [See "Foreign Military Digests" section]
Operations of the "Greater Germany" infantry regiment south of Amiens, June 1940. [See "Foreign Military Digests" section]
The panzer divisions. [See "Foreign Military Digests" section]
German armored troops. [See "Foreign Military Digests" section]

Weapons

Weapons of German and British infantry battalions. (Inf Jour — Jul 1941)

GERMANY (NAVY OF)

The navies of the chief sea powers. (Jour RUSI — May 1941)
The arming of hostile merchant ships. (Ws & Wr — Mar 1941)

GREAT BRITAIN (ARMY OF)

Command and Staff

The Empire's military leaders. (A Quar — Jul 1941)

History

The drama of early invasions of Britain. (Jour R Art — Apr 1941)
The history and traditions of the Royal Artillery. (Jour R Art — Apr 1941)

Organization and Equipment

A job for fighters. (Aero — 9 May 1941)
Modern cockpit controls and equipment. (Aero — 9 May 1941)
Holding up the army's umbrella. (Aero — 30 May 1941)
The soldier as Empire builder. (A Quar — Jul 1941)
"The case for an army air arm." (Ftg Forc — Aug 1941)
Army welfare and education. (Jour RUSI — May 1941)
England's preparedness potentiality at the outbreak of war in 1939. (Mil Mitt — Apr 1941)
Flight refuelling. (RAF Quar — Mar 1941)
On organization. (RAF Quar — Jun 1941)

Training

Fighter pilots in the making. (Aero — 13 Jun 1941)
Civil pilots in service aircraft. (Aero — 13 Jun 1941)
The army and air power. (Aero — 20 Jun 1941)
An artillery action in Somaliland. (FA Jour — Jun 1941)
Notes on the war in the air. (Ftg Forc — Aug 1941)
Suggestions for unit training. (Jour RUSI — May 1941)
Divisional R.E. units equipment on active service. (Roy Eng Jour — Jun 1941)
With the B.E.F. in Flanders. (Tank — Apr 1941)
The training of a cavalryman (modern version). (Ill Lon News — 26 Apr 1941)
Hit where it hurts most. [See "Foreign Military Digests" section]
Command — Training the mind's eye. (A Quar — Jul 1941)

Weapons

Weapons of German and British infantry battalions. (Inf Jour — Jul 1941)

GREAT BRITAIN (NAVY OF)

The war at sea. March-April, 1941. (A Quar — Jul 1941)
The navies of the chief sea powers. (Jour RUSI — May 1941)
The truth of the Hampshire affair. (Nav Inst Proc — Jun 1941)
Aircraft and sea warfare. (Ill Lon News — 7 Jun 1941)
The war with Nazi Germany. (Ill Lon News — 7 Jun 1941)
Singapore — British naval base. [See "Foreign Military Digests" section]

GREECE (ARMY OF)

Accomplishments of the Greek Army in the wars from 1897 to 1922. (Mil-Woch — 2 May 1941)

GREENLAND

Around the bases: Greenland. (Inf Jour — Jun 1941)

H

HARBOR DEFENSE

Air power and coast defense. (A Ord — Sep-Oct 1941)

HISTORY (MILITARY)

Command — Training the mind's eye. (A Quar — Jul 1941)

I

ICELAND

Around the bases: Iceland. (Inf Jour — Aug 1941)

INFANTRY

Manuals Regulations

The art of obscurity. (Inf Jour — Jul 1941)

Organization and Equipment

Infantry rifle regiment. (Cav Jour — Jul-Aug 1941)
Infantry staffs. (Ejercito — Feb 1941)
Infantry. A commentary. (Ejercito — Apr 1941)
One grade of infantry, with the morale of the Spanish race. (Ejercito — May 1941)
The Italian Central School of Infantry. (Ejercito — Jul 1941)
With the other arms and services: II — The infantry in 1941. (FA Jour — Jul 1941)
The regiments unfurl their battle colors. (Inf Jour — Jun 1941)
Mobility for small headquarters staff sections. (Inf Jour — Jun 1941)
From the Chief's Office: The Service Company. (Inf Jour — Jun 1941)
Fighting man's new headgear. (Inf Jour — Jul 1941)
From the Chief's Office: The Medical Detachment, Infantry Regiment. (Inf Jour — Aug 1941)
From the Chief's Office: Experimental Motorized Division. (Inf Jour — Aug 1941)
The infantry mind. (Inf Jour — Aug 1941)
The infantry truck. (Inf Jour — Sep 1941)
From the Chief's Office: The Headquarters Company (rifle regiment). (Inf Jour — Sep 1941)
Regarding the French army (with special reference to infantry). (Rev Mil — Apr, May 1941)

Supply

From the Chief's Office: The Service Company. (Inf Jour — Jul 1941)

Training Tactics

With the other arms and services: II — The infantry in 1941. (FA Jour — Jul 1941)
Steeplechase for soldiers. (Inf Jour — Jul 1941)
Marksmanship: aptitude or skill? (Inf Jour — Jul 1941)
Vehicle spacing in motor columns. (Inf Jour — Aug 1941)
Modern infantry in a river crossing. (Inf Jour — Aug 1941)
Antiaircraft defense with infantry units. (Rev Mil — Jul 1941)
Special aspects in the organization of the march and encounter combat by the infantry division in the winter. (Voy Vy — Feb 1941)
The organization of reconnaissance by infantry regiment headquarters. (Voy Vy — Feb 1941)
The organization of instruction for observers in small infantry and horse cavalry units. (Voy Vy — Feb 1941)
The brunt of the battle. [See page 17]
Armored infantry in action. [See page 23]
The shock troop engagement of the 111th Infantry against Bachy on 24 May. [See "Foreign Military Digests" section]
Infantry — a commentary. [See "Foreign Military Digests" section]
The Sommauthe Woods battle of the 118th Infantry on 23 May. [See "Foreign Military Digests" section]
Motorized infantry company attacks Calais. [See "Foreign Military Digests" section]
Operations of the "Greater Germany" infantry regiment south of Amiens, June 1940. [See "Foreign Military Digests" section]
The attack on Festieux by the 5th Company, 75th Infantry, and the march to the Aisne, 20 May 1940. [See "Foreign Military Digests" section]
Rifle fire against aircraft. [See "Foreign Military Digests" section]

Weapons

Weapons of German and British infantry battalions. (Inf Jour — Jul 1941)
Continuous tracking with the fifty-caliber. (Inf Jour — Aug 1941)

INTELLIGENCE (MILITARY)

Artillery information service. (Ejercito — Apr 1941)
Lessons in military intelligence. (FA Jour — Aug 1941)
Information service of the artillery. (Rev Mil — May 1941)
The organization of reconnaissance by infantry regiment headquarters. (Voy Vy — Feb 1941)
S O P intelligence. [See page 38]

INTERNATIONAL RELATIONS

Monroe Doctrine — Pan-Americanism — U.S.A. — Imperialism. (Mil Mitt — May 1941)

IRAQ

Finances and oil in Iraq. (Mil-Woch — 11 Jul 1941)
German motor transport troops in Iraq. (Panzer — Jun 1941)

ITALY (ARMY OF)

Aeronautical engineering — Fascist fashions. (Aero — 20 Jun 1941)
The Italian Central School of Infantry. (Ejercito — Jul 1941)
The Italian failures. (Jour RUSI — May 1941)
Italy in the present war. (Mil-Woch — 25 Apr 1941)
The modern Italian Navy. (Mil Af — Summer 1941)

ITALY (NAVY OF)

The navies of the chief sea powers. (Jour RUSI — May 1941)

J

JAPAN (ARMY OF)

Japan-in-China. (Fortune — Sep 1941)

JAPAN (NAVY OF)

The navies of the chief sea powers. (Jour RUSI — May 1941)
Japan as a sea power. (Mil Mitt — Jul 1941)

JOINT OPERATIONS

Tanks and terrain. (MC Gaz — Jun 1941)

L

LANDING OPERATIONS

A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
Tanks and terrain. (MC Gaz — Jun 1941)
Soldiers and Marines capture a deserted beach. (Life — 4 Aug 1941)

LAW (MILITARY AND INTERNATIONAL)

The arming of hostile merchant ships. (Ws & Wr — Mar 1941)

LEADERSHIP

"Moral" in the War 1914-1918. (A Quar — Jul 1941)
The Empire's military leaders. (A Quar — Jul 1941)
Wavell's Middle East command. (Inf Jour — Sep 1941)
Men, fear and panic. (Inf Jour — Sep 1941)
Suggestions for unit training. (Jour RUSI — May 1941)
"There is nothing new under the sun." (QM Rev — May-Jun 1941)
High commanders of the A.E.F. (Rec News — Aug 1941)
The company commander. [See page 5]
Assault of fortified positions. [See page 12]
Discipline "new style" in the German army. [See page 29]
Progressive training of officers. [See page 41]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]

LIAISON

Air force in support of ground forces. (Cav Jour — Jul-Aug 1941)
Artillery in direct support of tanks. (FA Jour — Jun 1941)
Air-borne field artillery. (FA Jour — Jul 1941)
Notes on liaison. (FA Jour — Jul 1941)
Tanks and terrain. (MC Gaz — Jun 1941)
The link between army and air co-operation in action. (Ill Lon News — 21 Jun 1941)
Assault of fortified positions. [See page 12]
The brunt of the battle. [See page 17]
Armored armies. [See page 20]
Antimechanized defense. [See page 34]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]
Infantry — a commentary. [See "Foreign Military Digests" section]
Artillery liaison detail with a tank battalion. [See "Foreign Military Digests" section]
Russian air power — the strategic plan. [See "Foreign Military Digests" section]

M

MACHINE GUNS

A special manner of mounting our heavy machine gun. (Rv Mil Suisse — Mar 1941)
Flank machine gun curtain fire. (Voy Vy — Feb 1941)

MANEUVERS

Umpiring for AAA. (CA Jour — May-Jun 1941)
Marking artillery fires. (FA Jour — Jun 1941)
The forward observer. (FA Jour — Jul 1941)
Armored field artillery in the Tennessee maneuvers. (FA Jour — Sep 1941)
A mirror for umpires. (Inf Jour — Sep 1941)
Comments on the First Army maneuvers in New York. (Mil Surg — Jul 1941)
Soldiers and Marines capture a deserted beach. (Life — 4 Aug 1941)
S O P intelligence. [See page 38]

MAP PROBLEMS

Armored infantry in action. [See page 23]
Artillery liaison detail with a tank battalion. [See "Foreign Military Digests" section]

MARCHES

Scout car — horse portée action in the prompt reduction of road blocks. (Cav Jour — May-Jun 1941)
The automotive driver. (FA Jour — Jun 1941)
Marching with Custer. (Vet Bul — Apr 1941)
Special aspects in the organization of the march and encounter combat by the infantry division in the winter. (Voy Vy — Feb 1941)
The attack on Festieux by the 5th Company, 75th Infantry, and the march to the Aisne, 20 May 1940. [See "Foreign Military Digests" section]

MARINE CORPS

Marine Corps aviation. (MC Gaz — Jun 1941)
Marine Corps rifle tests: Springfield, Garand, Johnson, Winchester. (MC Gaz — Jun 1941)
Keep them firing. (MC Gaz — Jun 1941)
Tanks and terrain. (MC Gaz — Jun 1941)
Marine parachute training. (Nav Inst Proc — Jul 1941)
Soldiers and Marines capture a deserted beach. (Life — 4 Aug 1941)

MARINE CORPS AVIATION

Marine Corps aviation. (MC Gaz — Jun 1941)

MARKSMANSHIP

Marksmanship: aptitude or skill? (Inf Jour — Jul 1941)

MECHANIZATION

Our new medium tank. (A Ord — Jul-Aug 1941)
The modern scout car. (A Ord — Jul-Aug 1941)
U. S. horse cavalry girds for war. (Cav Jour — May-Jun 1941)
Cavalry bridge requirements and the cable bridge. (Cav Jour — May-Jun 1941)
Horse cavalry regiments (reinforced) prepares to meet a mechanized attack. (Cav Jour — Jul-Aug 1941)
The versatile Jeep. (FA Jour — Jun 1941)
Army and super-army. (Inf Jour — Aug 1941)
Armored armies. [See page 20]
The cavalry regiment (horse and mechanized). [See page 25]
New aspects of the war in the west. [See "Foreign Military Digests" section]
Artillery helps itself. [See "Foreign Military Digests" section]

MEDICAL SERVICE

The clinical use of the sulfamido compounds. (A Med Bul — Apr 1941)
Vaccination against yellow fever. (A Med Bul — Apr 1941)
Cavalry medical problems. (Cav Jour — May-Jun 1941)
The battalion medical officer. (Ejercito — Feb 1941)
The medical service. (Ejercito — Jun 1941)
From the Chief's Office: The Medical Detachment, Infantry Regiment. (Inf Jour — Aug 1941)
Musings on medical evacuation in mobile warfare. (Jour RAMC — Apr 1941)
The treatment of the soldier's foot. (Jour RAMC — May 1941)
A new kind of shock. (Jour RAMC — May 1941)
Hand carriage of wounded. (Jour RAMC — May 1941)
The work of a regimental medical officer. (Jour RAMC — Jun 1941)
Digestive disorders in the forces. (Jour RAMC — Jun 1941)
The value of low spinal block (lumbo-sacral) analgesia in the treatment of shock associated with wounds of the lower extremities. (Jour RAMC — Jun 1941)
Miniature radiography and sputum examination in 100,000 Australian recruits. (Jour RAMC — Jun 1941)
The clarification of water for re-use by a mobile bath unit. (Jour RAMC — Jul 1941)
Anaesthetic apparatus for use in the field. (Jour RAMC — Jun 1941)
Burns in wartime. (Jour RAMC — Jul 1941)
Treatment of burns in wartime. (Jour RAMC — Jul 1941)
The assessment of functional recovery after war wounds of the limbs. (Jour RAMC — Jul 1941)
Rheumatism in the army and the rational campaign against it. (Jour RAMC — Jul 1941)
The prophylactic treatment of venereal disease. (Jour RAMC — Jul 1941)
Personal experiences in France. (Jour RAMC — Jul 1941)
Thirty-one hundred miles with the First Medical Regiment. (Mil Surg — Jun 1941)
The medical and sanitary care of civilian population necessitated by attacks from hostile aircraft. (Mil Surg — Jun 1941)
The relief of pruritus by benzoyl persulfide, especially in dermatitis from poison ivy and in insect bites. (Mil Surg — Jun 1941)
Urology in war. (Mil Surg — Jun 1941)
Neuropsychiatric examination for induction or enlistment in the army. (Mil Surg — Jun 1941)
Problems of ventilation for vessels of the navy. (Mil Surg — Jun 1941)
Treatment of rattlesnake bite. (Mil Surg — Jun 1941)
Treatment of gonorrhea with sulfathiazole. (Mil Surg — Jun 1941)
The cigarette, the soldier, and the pyhsician. (Mil Surg — Jul 1941)
Comments on the First Army maneuvers in New York. (Mil Surg — Jul 1941)
Treatment of war wounds based on their bacteriology. (Mil Surg — Jul 1941)
Shock, blood transfusion and supportive treatment. (Mil Surg — Jul 1941)
Nature and the treatment of shock. (Mil Surg — Jul 1941)
Radiology in military practice. (Mil Surg — Jul 1941)
Some eye, ear, nose and throat findings in men being examined for enrollment in the Civilian Conservation Corps. (Mil Surg — Jul 1941)
"Atmospheric Chamber" for flight examination. (Mil Surg — Jul 1941)
Malingering — a study. (Mil Surg — Aug 1941)
Scurvy, the soldier's calamity. (Mil Surg — Aug 1941)
The effect of military requirements on civilian aviation. (Mil Surg — Aug 1941)
Medical military training for civilians. (Mil Surg — Aug 1941)
A unique apparatus for cooking and for boiling water in the field. (Mil Surg — Aug 1941)
Cyclopropane anesthesia in military surgery. (Mil Surg — Aug 1941)
First aid and emergency treatment of gunshot wounds of the jaws. (Mil Surg — Aug 1941)
Medical problems in flying. [See "Foreign Military Digests" section]

MEETING ENGAGEMENTS

Tactical problem. (Rev Mil — Apr, Jun 1941)

MOBILE WARFARE

Musings on medical evacuation in mobile warfare. (Jour RAMC — Apr 1941)
Reconnaissance. [See "Foreign Military Digests" section]

MOBILIZATION

Selective service. (Res Off — Jun 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)

Industrial Mobilization

Armament engineering. (A Ord — Jul-Aug 1941)
Wartime production: steel and guns. (FA Jour — Aug 1941)
Money, production, and time. (Inf Jour — Jun 1941)
Eliminating bottlenecks in national defense. (Nav Inst Proc — Jun 1941)
Prelude to total war. (Fortune — Jul 1941)

MOBILITY

The modern scout car. (A Ord — Jul-Aug 1941)
Half-tracks for mobility. (A Ord — Sep-Oct 1941)
Mobility for small headquarters staff sections. (Inf Jour — Jun 1941)
Mobile armored units in mountain defense. (Rv Mil Suisse — Mar 1941)
The link between army and air co-operation in action. (Ill Lon News — 21 Jun 1941)
The furious speed of modern warfare. (Ill Lon News — 28 Jun 1941)
Armored armies. [See page 20]
The cavalry regiment (horse and mechanized). [See page 25]
A tank platoon in battle against a hostile tank platoon. [See page 30]
New aspects of the war in the west. [See "Foreign Military Digests" section]
Artillery helps itself. [See "Foreign Military Digests" section]
Mobile armored units in mountain defense. [See "Foreign Military Digests" section]
Reconnaissance. [See "Foreign Military Digests" section]

MORALE (MILITARY)

"Moral" in the War 1914-1918. (A Quar — Jul 1941)
Army morale. (Ejercito — Jan 1941)
Morale and arms. (Ejercito — Apr 1941)

The spirit of the German soldier. (Mil-Woch — 18 Apr 1941)
Morale of troops. (Rv Mil Suisse — Apr 1941)
Camp morale — What goes on? (Liberty — 2 Aug 1941)
Discipline "new style" in the German army. [See page 29]
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]

MOTORCYCLES
Mounting trooper's individual equipment on solo motorcycle. (Cav Jour — May-Jun 1941)
Motorcycle platoon in dismounted attack. (Cav Jour — Jul-Aug 1941)

MOTORIZATION
Our new medium tank. (A Ord — Jul-Aug 1941)
The modern scout car. (A Ord — Jul-Aug 1941)
Half-tracks for mobility. (A Ord — Sep-Oct 1941)
U.S. horse cavalry girds for war. (Cav Jour — May-Jun 1941)
Rubber tires, cavalry. (Cav Jour — May-Jun 1941)
Cavalry bridge requirements and the cable bridge. (Cav Jour — May-Jun 1941)
Motorcycle platoon in dismounted attack. (Cav Jour — Jul-Aug 1941)
Motorized artillery. (Ejercito — Feb 1941)
Automobile (repair and maintenance) service. (Ejercito — Jun 1941)
The versatile Jeep. (FA Jour — Jun 1941)
The automotive driver. (FA Jour — Jun 1941)
Vehicle spacing in motor columns. (Inf Jour — Aug 1941)
From the Chief's Office: Experimental Motorized Division. (Inf Jour — Aug 1941)
The infantry truck. (Inf Jour — Sep 1941)
German army motor transportation. (QM Rev — May-Jun 1941)
Driving in column and leading one. (QM Rev — May-Jun 1941)
Motor transport training. (Res Off — Aug 1941)
New reflections concerning motorization. (Rev Mil — Apr 1941)
Divisional R.E. units equipment on active service. (Roy Eng Jour — Jun 1941)
New aspects of the war in the west. [See "Foreign Military Digests" section]
Artillery helps itself. [See "Foreign Military Digests" section]
Motorized infantry company attacks Calais. [See "Foreign Military Digests" section]
The motorized division. [See "Foreign Military Digests" section]

N

NATIONAL DEFENSE
Armament engineering. (A Ord — Jul-Aug 1941)
Air power and coast defense. (A Ord — Sep-Oct 1941)
Home defense. (Inf Jour — Aug 1941)
England's preparedness potentiality at the outbreak of war in 1939. (Mil Mitt — Apr 1941)
Blackouts. (Mil Eng — May-Jun 1941)
The air transport industry in the national defense. (Mil Eng — May-Jun 1941)
Rubber in the national defense. (Mil Eng — Jul-Aug 1941)
Eliminating bottlenecks in national defense. (Nav Inst Proc — Jun 1941)
Air power is sea power. (Nav Inst Proc — Jul 1941)
Selective service. (Res Off — Jun 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)

NAVAL WARFARE
Air power and coast defense. (A Ord — Sep-Oct 1941)
The war at sea. March-April, 1941. (A Quar — Jul 1941)
The floating fortress. (CA Jour — May-Jun 1941)
The navies of the chief sea powers. (Jour RUSI — May 1941)
The influence of democracy upon sea power. (Nav Inst Proc — Jun 1941)
The truth of the Hampshire affair. (Nav Inst Proc — Jun 1941)
The future fleet. (Nav Inst Proc — Aug 1941)
The Byzantine reconquest of Crete. (Nav Inst Proc — Aug 1941)
The sea battle. (Tank — Jun 1941)
Aircraft and sea warfare. (Ill Lon News — 7 Jun 1941)
The war with Nazi Germany. (Ill Lon News — 7 Jun 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)
The riddle of 1941. (Round Table — Jun 1941)
The battle of Crete. [See "Foreign Military Digests" section]

NEAR EAST
Military geography of the Near East. (Inf Jour — Jul 1941)
Transportation development in the Near East. (Panzer — May 1941)

NETHERLANDS (ARMY OF)
Incidents from the War: Experiences of a Dutch artillery detachment during the invasion of Holland. (FA Jour — Sep 1941)

NEWFOUNDLAND
Newfoundland, North Atlantic rampart. (Nat Geog — Jul 1941)

O

OBSTACLES
Steeplechase for soldiers. (Inf Jour — Jul 1941)
Barrier tactics. (Mil Eng — May-Jun 1941)
Modern military obstacle technique. (Mil Eng — May-Jun 1941)
Military obstacle course. (Mil Eng — Jul-Aug 1941)
Assault of fortified positions. [See page 12]

OIL
The natural resources of Egypt and Arabia. (Mil-Woch — 6 Jun 1941)
Finances and oil in Iraq. (Mil-Woch — 11 Jul 1941)
Military oil storage. (Mil Eng — May-Jun 1941)
Navy contract lubricants. (Mil Eng — May-Jun 1941)
Eliminating bottlenecks in national defense. (Nav Inst Proc — Jun 1941)
Oil for the world's navies. (Nav Inst Proc — Jul 1941)
Reconditioning oil. (Panzer — Apr 1941)
Oil and war. (Rv Mil Suisse — Jun, Jul 1941)
The oil situation in Rumania. (Roy Eng Jour — Jun 1941)
The paradox of oil and war. (Fortune — Sep 1941)

ORDNANCE
Our new medium tank. (A Ord — Jul-Aug 1941)
Ordnance in the new army. (A Ord — Jul-Aug 1941)
Tactical organization of the army — a new fast-moving, hard-hitting field force. (A Ord — Jul-Aug 1941)
Armament engineering. (A Ord — Jul-Aug 1941)
Planned munitions, II. (A Ord — Jul-Aug 1941)
Ordnance on the march. (A Ord — Sep-Oct 1941)
Ammunition at the front. (A Ord — Sep-Oct 1941)
Half-tracks for mobility. (A Ord — Sep-Oct 1941)
Gages for guns. (A Ord — Sep-Oct 1941)
Weapons depend on gages. (A Ord — Sep-Oct 1941)
A new light rifle. (A Ord — Sep-Oct 1941)
War rockets of the past. (CA Jour — May-Jun 1941)
Device for measuring powder temperature. (FA Jour — Jun 1941)
Pyrotechnics as an aid to the forward observer. (FA Jour — Aug 1941)
With the other arms and services: Ordnance. (FA Jour — Sep 1941)
The new medium tank. (Inf Jour — Jun 1941)

ORGANIZATION (MILITARY)
"There is nothing new under the sun." (QM Rev — May-Jun 1941)
On organization. (RAF Quar — Jun 1941)
Tactics of the blitzkrieg. [See "Foreign Military Digests" section]

P

PACIFIC OCEAN
The Aleutians — their strategic importance. (Nav Inst Proc — Jun 1941)

PANIC
Men, fear and panic. (Inf Jour — Sep 1941)

PARACHUTES
"New worlds for old." (Aero — 9 May 1941)
Landings by parachute troops. (Ejercito — Feb 1941)
Marine parachute training. (Nav Inst Proc — Jul 1941)
Might from the skies. (Res Off — Aug 1941)
The battle of Crete. [See "Foreign Military Digests" section]

PHILIPPINE ARMY
The Philippine Military Academy. (CA Jour — Jul-Aug 1941)

PHILIPPINE ISLANDS
Trip to Baguio and Banaue. (CA Jour — May-Jun 1941)

PHOTOGRAPHY
Paperwork by camera. (Inf Jour — Jun 1941)

PROPAGANDA
Propaganda. (Ejercito — Apr 1941)

PSYCHOLOGY (MILITARY)
Rubber tires, cavalry. (Cav Jour — May-Jun 1941)
Men, fear and panic. (Inf Jour — Sep 1941)
"German Psychological Warfare." (Inf Jour — Sep 1941)

Q

QUARTERMASTER SERVICE
Quartermaster Corps activities in the Hawaiian Department. (QM Rev — May-Jun 1941)
The Depot Inspection Section, Philadelphia QM Depot. (QM Rev — May-Jun 1941)
Training the Quartermaster Corps. (QM Rev — Jul-Aug 1941)
Feeding the new army. (QM Rev — Jul-Aug 1941)
Rail traffic. (QM Rev — Jul-Aug 1941)
How to do it. (QM Rev — Jul-Aug 1941)
A suggestion for sales officers. (QM Rev — Jul-Aug 1941)
"Blitz" service. (Res Off — Jul 1941)

R

RECEPTION CENTERS
The reception center. [See page 35]

RECONNAISSANCE
The armored force: Reconnaissance battalion, armored division. (Cav Jour — May-Jun 1941)
Artillery observation. (FA Jour — Aug 1941)
The organization of reconnaissance by infantry regiment headquarters. (Voy Vy — Feb 1941)
The methods of compiling a reconnaissance plan. (Voy Vy — Feb 1941)
The cavalry regiment (horse and mechanized). [See page 25]
The cavalry reconnaissance detachment of the 46th Division in the drive against Blangy on 6 June. [See "Foreign Military Digests" section]
Reconnaissance. [See "Foreign Military Digests" section]

RECRUITS RECRUITING
Combat instruction in the training of recruits. (Rv Mil Suisse — Jul 1941)

REMOUNT SERVICE
Mountain troops. Remounts for mountain units of the German Army. (Cav Jour — May-Jun 1941)
War horse. (Vet Bul — Apr 1941)

RIVER CROSSINGS
Cavalry swims full pack. (Cav Jour — Jul-Aug 1941)
Portable boat for stream crossing. (Cav Jour — Jul-Aug 1941)
Modern infantry in a river crossing. (Inf Jour — Aug 1941)
Engineers in battle. (Mil Eng — May-Jun, Jul-Aug 1941)
The "Undiscouraged Engineers"; the 24th Engineer Battalion at the crossing of the Marne in July 1918. (Rev Mil — Apr 1941)
Crossing of ice by a large cavalry unit. (Voy Vy — Feb 1941)
The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]
German advance guard in action — crossing the Seine. [See "Foreign Military Digests" section]

ROUTES COMMUNICATIONS

Bridges Bridging
Cavalry bridge requirements and the cable bridge. (Cav Jour — May-Jun 1941)
Bridges built by the engineers. (Ejercito — Mar 1941)
You can't cross bridges unless you have them. (Inf Jour — Jul 1941)
New portable timber military bridge. (Mil Eng — May-Jun 1941)
Emergency ponton bridge at Hidalgo, Texas. (Mil Eng — May-Jun 1941)
Developments in design of ponton bridges. (Mil Eng — May-Jun 1941)
Military bridges and bridging. (Mil Eng — Jul-Aug 1941)
Material of pontoon bridges in the German army. (Rev Mil — Apr 1941)

Highways Military Roads
Transportation development in the Near East. (Panzer — May 1941)
The unbelievable Burma Road. (Fortune — Sep 1941)

Railways
The strategic significance of the Grecian railroad net. (Mil-Woch — 9 May 1941)
Bolivia and the Arica-Santos Railway. (Mil Eng — Jul-Aug 1941)
Transportation development in the Near East. (Panzer — May 1941)
Rail traffic. (QM Rev — Jul-Aug 1941)
The military railway service. (Res Off — Jun 1941)

Waterways
Gulf coast waterways. (Mil Eng — May-Jun 1941)
The Caribbean — an American lake. (Nav Inst Proc — Jul 1941)

RUBBER
Rubber in the national defense. (Mil Eng — Jul-Aug 1941)

RUMANIA
The oil situation in Rumania. (Roy Eng Jour — Jun 1941)

RUSSIA (ARMY OF)
The Red artillery. (FA Jour — Jul 1941)
Russia in the World War, 1914-1918. (Mil Eng — Jul-Aug 1941)
The army of the socialist land. (Voy Vy — Feb 1941)
Special aspects in the organization of the march and encounter combat by the infantry division in the winter. (Voy Vy — Feb 1941)
The organization of reconnaissance by infantry regiment headquarters. (Voy Vy — Feb 1941)
The methods of compiling a reconnaissance plan. (Voy Vy — Feb 1941)
Methods of conducting instruction of officers. (Voy Vy — Feb 1941)
The organization of instruction for observers in small infantry and horse cavalry units. (Voy Vy — Feb 1941)
Flank machine gun curtain fire. (Voy Vy — Feb 1941)
Crossing of ice by a large cavalry unit. (Voy Vy — Feb 1941)
Soviet industry. (Fortune — Jul 1941)
Russian air power. [See "Foreign Military Digests" section]

RUSSIA (NAVY OF)
Russia in the World War, 1914-1918. (Mil Eng — Jul-Aug 1941)

S

SEA POWER
"New worlds for old." (Aero — 9 May 1941)
The air challenge to sea power. (Aero — 16 May 1941)
Japan as a sea power. (Mil Mitt — Jul 1941)
The influence of democracy upon sea power. (Nav Inst Proc — Jun 1941)
Air power is sea power. (Nav Inst Proc — Jul 1941)
The Byzantine reconquest of Crete. (Nav Inst Proc — Aug 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)
The riddle of 1941. (Round Table — Jun 1941)
The strategy of the War. (Round Table — Jun 1941)

SIGNAL SERVICE
Radio equipment for horse cavalry. (Cav Jour — Jul-Aug 1941)
Listening and code services. (Ejercito — May 1941)
German signal communications. (FA Jour — Aug 1941)
Coding coordinates. (Inf Jour — Aug 1941)
The auxiliary axis of communications. (Rev Mil — Apr 1941)
Deciphering blitzed documents. (Ill Lon News — 26 Apr 1941)

SINGAPORE
Singapore. (Ws & Wr — Jun 1941)
Singapore — British naval base. [See "Foreign Military Digests" section]

SNOW TROOPS
Cavalry snow trooping (H & M). (Cav Jour — Jul-Aug 1941)

SPAIN (ARMY OF)
Mountain units. (Ejercito — Jan 1941)
Army morale. (Ejercito — Jan 1941)
Training in the army. (Ejercito — Feb 1941)
The training of the soldier. (Ejercito — Mar 1941)
Instruction in the army. (Ejercito — Apr, May 1941)
The problem of the noncommissioned officer. (Ejercito — Jun 1941)
The Germans, Spaniards and French as soldiers. (Mil-Woch — 23 May 1941)

SUPPLY
"New worlds for old." (Aero — 9 May 1941)

Ordnance in the new army. (A Ord — Jul-Aug 1941)
Tactical organization of the army — a new fast-moving, hard-hitting field force. (A Ord — Jul-Aug 1941)
Ordnance on the march. (A Ord — Sep-Oct 1941)
Ammunition at the front. (A Ord — Sep-Oct 1941)
Field supply of a cavalry regiment (H & M). (Cav Jour — May-Jun 1941)
Supply of a horse regiment. (Cav Jour — May-Jun, Jul-Aug 1941)
Feeding the soldier. (Ejercito — Jun 1941)
Loading of field artillery materiel for railway transport. (FA Jour — Jun 1941)
Money, production, and time. (Inf Jour — Jun 1941)
From the Chief's Office: The Service Company. (Inf Jour — Jul 1941)
Natural resources of Egypt and Arabia. (Mil-Woch — 6 Jun 1941)
English supply across the Channel. (Mil-Woch — 13 Jun 1941)
Military oil storage. (Mil Eng — May-Jun 1941)
Navy contract lubricants. (Mil Eng — May-Jun 1941)
Eliminating bottlenecks in national defense. (Nav Inst Proc — Jun 1941)
Oil for the world's navies. (Nav Inst Proc — Jul 1941)
Reconditioning oil. (Panzer — Apr 1941)
Feeding the new army. (QM Rev — Jul-Aug 1941)
How to do it. (QM Rev — Jul-Aug 1941)
Oil and war. (Rv Mil Suisse — Jun, Jul 1941)
The oil situation in Rumania. (Roy Eng Jour — Jun 1941)
The panzer divisions. (Tank — Jun 1941)
Quick-frozen foods — fish. (Vet Bul — Apr 1941)
Soviet industry. (Fortune — Jul 1941)
The paradox of oil and war. (Fortune — Sep 1941)
Airplanes supply tank ammunition. [See "Foreign Military Digests" section]
The panzer divisions. [See "Foreign Military Digests" section]

SWITZERLAND (ARMY OF)

The Swiss Army. (FA Jour — Aug 1941)
Instruction and education. (Rv Mil Suisse — May 1941)
Officers and their uniforms. (Rv Mil Suisse — Jul 1941)
Combat instruction in the training of recruits. (Rv Mil Suisse — Jul 1941)
Switzerland sits tight. (Fortune — Sep 1941)

T

TACTICS OPERATIONS

Defensive Combat

A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
War as viewed by French and British writers. (Ws & Wr — May 1941)
Antimechanized defense. [See page 34]

Offensive Combat

The fall of Belgium. (FA Jour — Jun 1941)
German assaults upon permanent fortifications. (FA Jour — Jun 1941)
Invasion of England — A preview. (FA Jour — Jul 1941)
A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
Breakthrough on the Somme. (Inf Jour — Sep 1941)
The French defense against the German breakthrough across the Meuse between Sedan and Namur in May 1940. (Mil Rund — Jun 1941)
The French version of the breakthrough at the Meuse. (Mil-Woch — 11, 18 Jul 1941)
Armored attack. (Our Army — Jul 1941)
Assault of fortified positions. [See page 12]
The brunt of the battle. [See page 17]
A tank platoon in battle against a hostile tank platoon. [See page 30]
Antimechanized defense. [See page 34]
The German breakthrough into Greece. [See "Foreign Military Digests" section]
Motorized infantry company attacks Calais. [See "Foreign Military Digests" section]

Special Warfare

Mountain troops. (Cav Jour — May-Jun 1941)
Mountain divisions in blitzkrieg. (FA Jour — Sep 1941)
Twentieth-century irregulars. (Inf Jour — Jun 1941)
Guerrilla warfare in China. (MC Gaz — Jun 1941)
Mobile armored units in mountain defense. (Rv Mil Suisse — Mar 1941) [See also "Foreign Military Digests" section]

TANKS

Our new medium tank. (A Ord — Jul-Aug 1941)
The modern scout car. (A Ord — Jul-Aug 1941)
Half-tracks for mobility. (A Ord — Sep-Oct 1941)
The protection of mechanical transport against A.F.Vs. (armored cars) in the back areas. (A Quar — Jul 1941)
Antitank corps. (Cav Jour — May-Jun 1941)
Mark I tank experiences in France. (Cav Jour — May-Jun 1941)
Air force in support of ground forces. (Cav Jour — Jul-Aug 1941)
Antitank fire with minus site. (FA Jour — Jun 1941)
Incidents from the Battle of France. (FA Jour — Jun 1941)
Artillery in direct support of tanks. (FA Jour — Jun 1941)
The fall of Belgium. The melée. (FA Jour — Jul 1941)
Technique and drill of the 75-mm antitank battery. (FA Jour — Jul 1941)
Fighting the panzers. (FA Jour — Aug 1941)
Armored attack south of A..... (FA Jour — Aug 1941)
The fall of Belgium. (FA Jour — Aug 1941)
The new medium tank. (Inf Jour — Jun 1941)
Army and super-army. (Inf Jour — Aug 1941)
Tanks and terrain. (MC Gaz — Jun 1941)
Barrier tactics. (Mil Eng — May-Jun 1941)
Modern military obstacle technique. (Mil Eng — May-Jun 1941)
Armored attack. (Our Army — Jul 1941)
So the tanks will come. (Res Off — Jul 1941)
Status of the armored force. (Res Off — Aug 1941)
The blowing up of an English tank in front of the most advanced lines during the battle of Flanders by the 52d Reserve Engineers Company. (Rev Mil — Jun 1941)
Mobile armored units in mountain defense. (Rv Mil Suisse — Mar 1941)
Antitank fire. (Rv Mil Suisse — Apr 1941)
Breakthrough action of a German tank regiment reinforced by motorized infantry on the Somme, 5-6 June 1940. (Rv Mil Suisse — Jul 1941)
The operations in Italian East Africa. (Tank — Mar 1941)
Development of the German panzer force. (Tank — Apr 1941)
With the B.E.F. in Flanders. (Tank — Apr 1941)
Tank lessons from Libya. (Tank — Apr 1941)
German armoured troops. (Tank — May 1941)
The panzer divisions. (Tank — Jun 1941)
The training of a cavalryman (modern version). (Ill Lon News — 26 Apr 1941)
A German panzer division moves into action. (Ill Lon News — 26 Apr 1941)
The first tank battle in history. (Ill Lon News — 17 May 1941)
The war with Nazi Germany. (Ill Lon News — 28 Jun 1941)
The furious speed of modern warfare. (Ill Lon News — 28 Jun 1941)
The brunt of the battle. [See page 17]
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Airplanes supply tank ammunition. [See "Foreign Military Digests" section]
Tanks in a sand storm. [See "Foreign Military Digests" section]
Motorized infantry company attacks Calais. [See "Foreign Military Digests" section]
Mobile armored units in mountain defense. [See "Foreign Military Digests" section]
The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]
The tank battle near Le Vivier Danger. [See "Foreign Military Digests" section]
Artillery liaison detail with a tank battalion. [See "Foreign Military Digests" section]
German advance guard in action — crossing the Seine. [See "Foreign Military Digests" section]
The panzer divisions. [See "Foreign Military Digests" section]
German armored troops. [See "Foreign Military Digests" section]

TERRAIN

Tanks and terrain. (MC Gaz — Jun 1941)

TOPOGRAPHY SURVEYING

Mountain topography in our war. (Ejercito — Mar 1941)
Lives that hung by a contour line. (Inf Jour — Jul 1941)
Coding coordinates. (Inf Jour — Aug 1941)
Do military maps meet modern demands? (Mil Rund — Mar 1941)

TRAFFIC CONTROL

Vehicle spacing in motor columns. (Inf Jour — Aug 1941)
How to do it. (QM Rev — Jul-Aug 1941)

TRANSPORTATION

Air transport by gliders. (Aero — 25 Apr 1941)
"New worlds for old." (Aero — 9 May 1941)
Loading of field artillery materiel for railway transport. (FA Jour — Jun 1941)
The air transport industry in the national defense. (Mil Eng — May-Jun 1941)
Transportation development in the Near East. (Panzer — May 1941)
German motor transport troops in Iraq. (Panzer — Jun 1941)
German army motor transportation. (QM Rev — May-Jun 1941)
Driving in column and leading one. (QM Rev — May-Jun 1941)
The military railway service. (Res Off — Jun 1941)
Motor transport training. (Res Off — Aug 1941)
Divisional R.E. units equipment on active service. (Roy Eng Jour — Jun 1941)
Winged invaders of Crete. (Ill Lon News — 31 May 1941)
The battle of Crete. [See "Foreign Military Digests" section]

TRINIDAD

Around the bases: Trinidad. (Inf Jour — Jul 1941)

U

UMPIRES

Umpiring for AAA. (CA Jour — May-Jun 1941)
A mirror for umpires. (Inf Jour — Sep 1941)

UNITED STATES (ARMY OF)

Auxiliary Military Forces

Our National Guard. (Mil Af — Summer 1941)

Bureau of Public Relations

The regiment in the news. (Inf Jour — Aug 1941)

Forts and Military Establishments

Cavalry replacement training center. (Cav Jour — May-Jun 1941)
C.R.T.C. at end of first cycle. (Cav Jour — Jul-Aug 1941)
Two replacement centers. (FA Jour — Jun 1941)
Fort Bragg, 1941. (FA Jour — Sep 1941)
Fort on the frontier. (Inf Jour — Sep 1941)
Construction of a semi-permanent camp at Fort Buchanan, Puerto Rico. (Mil Eng — May-Jun 1941)
Construction of the Puerto Rican general depot. (Mil Eng — May-Jun 1941)
Quartermaster Corps activities in the Hawaiian Department. (QM Rev — May-Jun 1941)
The reception center. [See page 35]

Mobilization

Selective service. (Res Off — Jun 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)

Organization and Equipment

Our new medium tank. (A Ord — Jul-Aug 1941)
Ordnance in the new army. (A Ord — Jul-Aug 1941)
Tactical organization of the army — a new fast-moving, hard-hitting field force. (A Ord — Jul-Aug 1941)
Gages for guns. (A Ord — Sep-Oct 1941)
Weapons depend on gages. (A Ord — Sep-Oct 1941)
A new light rifle. (A Ord — Sep-Oct 1941)
Fighting equipment of army divisions. (A Ord — Sep-Oct 1941)
The floating fortress. (CA Jour — May-Jun 1941)
Air-borne field artillery. (FA Jour — Jul 1941)
Field artillery — 1941. (FA Jour — Sep 1941)
The regiments unfurl their battle colors. (Inf Jour — Jun 1941)
Home defense. (Inf Jour — Aug 1941)
The military railway service. (Res Off — Jun 1941)
America bares its weapons of attack as the time for action draws nearer. (Life — 4 Aug 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)
America's gathering strength. (Round Table — Jun 1941)
Mighty "Winged Army" the goal for America. (U.S. Air Services — Jul 1941)
B-19 — Guardian of a hemisphere. (U.S. Air Services — Jul 1941)
The cavalry regiment (horse and mechanized). [See page 25]

Personnel

Types of enlisted officer-candidates. (FA Jour — Sep1941)

Training

U.S. horse cavalry girds for war. (Cav Jour — May-Jun 1941)
Umpiring for AAA. (CA Jour — May-Jun 1941)
Tactical training of AAA in the Third Army. (CA Jour — May-Jun 1941)
Marking artillery fires. (FA Jour — Jun 1941)
Air-borne field artillery. (FA Jour — Jul 1941)
The forward observer. (FA Jour — Jul 1941)
Armored field artillery in the Tennessee maneuvers. (FA Jour — Sep 1941)
Physical efficiency. (Inf Jour — Aug 1941)
A mirror for umpires. (Inf Jour — Sep 1941)
Comments on the First Army maneuvers in New York. (Mil Surg — Jul 1941)
Selective service. (Res Off — Jun 1941)
Soldiers and Marines capture a deserted beach. (Life — 4 Aug 1941)

War Department

S O P intelligence. [See page 38]

UNITED STATES (NAVY OF)

Auxiliary Naval Forces

The Coast Guard as a naval asset. (Nav Inst Proc — Jul 1941)

Organization and Equipment

The navies of the chief sea powers. (Jour RUSI — May 1941)
Problems of ventilation for vessels of the navy. (Mil Surg — Jun 1941)
The future fleet. (Nav Inst Proc — Aug 1941)
Emporiums afloat. (Nav Inst Proc — Aug 1941)
Torpedo boats. (Nav Inst Proc — Aug 1941)
Ships for this war. (Fortune — Jul 1941)
America bares its weapons of attack as the time for action draws nearer. (Life — 4 Aug 1941)

Supply

Navy contract lubricants. (Mil Eng — May-Jun 1941)

Training

Soldiers and Marines capture a deserted beach. (Life — 4 Aug 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)

V

VETERINARY SERVICE

Cavalry medical problems. (Cav Jour — May-Jun 1941)
The veterinary service. (Ejercito — Jan 1941)
Animal casualties from chemical warfare agents. (Mil Surg — Aug 1941)
Quick-frozen foods — fish. (Vet Bul — Apr 1941)
Animal casualties from chemical warfare agents. (Vet Bul — Apr 1941)
Training of the regimental veterinary section. (Vet Bul — Apr 1941)
Physical examination of dairy cattle. (Vet Bul — Apr 1941)
Marching with Custer. (Vet Bul — Apr 1941)
Territorial animal quarantine station and the army section. (Vet Bul — Jul 1941)
Western spread of eastern type equine encephalomyelitis virus. (Vet Bul — Jul 1941)
A method of determining the internal temperature and rate of heat penetration in canned products during processing. (Vet Bul — Jul 1941)
The use of filtered bacterial cultures (antivirus-besredka) in veterinary medicine. (Vet Bul — Jul 1941)
Another phase of army veterinary service. (Vet Bul — Jul 1941)
The evolution of the horse. (Vet Bul — Jul 1941)
Horse activity in Hawaii. (Vet Bul — Jul 1941)
Animal sex control. (Vet Bul — Jul 1941)

W

WAR PEACE

The economics of war. (Ejercito — Jan, Jun 1941)
Prelude to total war. (Fortune — Jul 1941)
This would be victory. (Fortune — Aug 1941)

WARS

ANCIENT

GREECE

The Byzantine reconquest of Crete. (Nav Inst Proc — Aug 1941)

AFRICA

EGYPT

Memoirs of the French expedition into Egypt, 1798-1801. (Ws & Wr — Jun 1941)

ASIA

JAPAN-CHINA (1930-)

Guerrilla warfare in China. (MC Gaz — Jun 1941)
The conflict in the Far East. (Mil Mitt — May, Jul 1941)

EUROPE

EARLY WARS

The drama of early invasions of Britain. (Jour R Art — Apr 1941)

16th CENTURY

The siege of Malta in 1565. (Ejercito — Jul 1941)

18th CENTURY

Russia — Turkey (1711-1878 [9 wars])

The Russo-Turkish frontier commission in Asia Minor, 1857. (Roy Eng Jour — Jun 1941)

CRIMEAN WAR (1853-1856)

The war in the Crimea. 1854. (Jour R Art — Apr 1941)

SPANISH CIVIL WAR (1936-1939)

The battle of Madrid. (Ejercito — Jan 1941)
Battle of the Ebro. (Ejercito — Jul 1941)
The "Red" engineer troops at the Ebro. (Ejercito— Jul 1941)

UNITED STATES

INDIAN CAMPAIGNS

Later 19th Century (1865-1901)

Fort on the frontier. (Inf Jour — Sep 1941)
Marching with Custer. (Vet Bul — Apr 1941)

WORLD WAR I (1914-1918)

"Moral" in the War 1914-1918. (A Quar — Jul 1941)
Wartime production. (FA Jour — Jun, Jul, Aug 1941)
Signposts of experience: Training — personnel — promotion — conclusion. (FA Jour — Sep 1941)
The Lost Battalion's last day. (Inf Jour — Jun 1941)
Preparations for war, 1914-1939. (Mil Mitt — Jul 1941)
Antiaircraft in the World War. (Mil-Woch — 30 May, 6 Jun 1941)
English supply across the Channel. (Mil-Woch — 13 Jun 1941)
The cooperation between captive balloons and other weapons, 1914-1918. (Mil-Woch — 18, 25 Jul 1941)
Russia in the World War, 1914-1918. (Mil Eng — Jul-Aug 1941)
The truth of the Hampshire affair. (Nav Inst Proc — Jun 1941)
High commanders of the A.E.F. (Rec News — Aug 1941)
The "Undiscouraged Engineers"; the 24th Engineer Battalion at the crossing of the Marne in July 1918. (Rev Mil — Apr 1941)
The blowing up of an English tank in front of the most advanced lines during the battle of Flanders by the 52d Reserve Engineers Company. (Rev Mil — Jun 1941)

WORLD WAR II (1939-)

"New worlds for old." (Aero — 9 May 1941)
A job for fighters. (Aero — 9 May 1941)
Holding up the army's umbrella. (Aero — 30 May 1941)
Invasion by air. (Aero — 30 May 1941)
Conquest by air bombardment. (Aero — 6 Jun 1941)
The war in the air. (Aero — 6 Jun 1941)
"Moral" in the War 1914-1918. (A Quar — Jul 1941)
The Empire's military leaders. (A Quar — Jul 1941)
The Second German War (April-June, 1941). (A Quar — Jul 1941)
The war at sea. March-April, 1941. (A Quar — Jul 1941)
The protection of mechanical transport against A.F.Vs. (Armoured cars) in the back areas. (A Quar — Jul 1941)
Antitank corps. (Cav Jour — May-Jun 1941)
German horse cavalry. Artillery for the fast units. (Cav Jour — May-Jun 1941)
Mark I tank experiences in France. (Cav Jour — May-Jun 1941)
An interlude in the campaign in Norway. (CA Jour — Jul-Aug 1941)
Notes from a visit to the western front. (Ejercito — Mar 1941)
The fall of Belgium. (FA Jour — Jun, Jul, Aug 1941)
How Eben Emael was taken. (FA Jour — Jun 1941)
German assaults upon permanent fortifications. (FA Jour — Jun 1941)
An artillery action in Somaliland. (FA Jour — Jun 1941)
The war in the Mediterranean area. (FA Jour — Jun 1941)
Incidents from the Battle of France. (FA Jour — Jun 1941)
Invasion of England — A preview. (FA Jour — Jul 1941)
A successful defense against an air-borne invasion. (FA Jour — Jul 1941)
Strictly according to the book. (FA Jour — Jul 1941)
Fighting the panzers. (FA Jour — Aug 1941)
Armored attack south of A..... (FA Jour — Aug 1941)
With the armies of foreign nations: a lesson from the conduct of war in North Africa. (FA Jour — Aug 1941)
Strictly according to the book: Forcing the Somme. (FA Jour — Aug 1941)
Artillery observation. (FA Jour — Aug 1941)
Campaign in Flanders, 1940. (FA Jour — Sep 1941)
Incidents from the War: Experiences of a Dutch artillery detachment during the invasion of Holland. (FA Jour — Sep 1941)
Artillery in the Russo-German War. (FA Jour — Sep 1941)
An amateur's first attempt at strategy. (FA Jour — Sep 1941)
The Near and Middle East. (Ftg Forc — Jun 1941)
Campaigns in the Middle East. (Ftg Forc — Aug 1941)
Notes on the war in the air. (Ftg Forc — Aug 1941)
The Russo-German War. (Ftg Forc — Aug 1941)
An interlude in the campaign in Norway. (Inf Jour — Jun 1941)
Counterbreakthrough. (Inf Jour — Jul, Aug, Sep 1941)
Army and super-army. (Inf Jour — Aug 1941)
Wavell's Middle East command. (Inf Jour — Sep 1941)
Breakthrough on the Somme. (Inf Jour — Sep 1941)
Personal experiences in France. (Jour RAMC — Jul 1941)
The air battles for Britain. (Jour RUSI — May 1941)
The Italian failures. (Jour RUSI — May 1941)
Diary of the war. (Jour RUSI — May 1941)
Tanks and terrain. (MC Gaz — Jun 1941)
A critical analysis of the British operation in German East Africa during the World War. (MC Gaz — Jun 1941)
The theater of war in North Africa. (Mil Mitt — Apr 1941)
Contemporary defense sketches. The theater of operations in Macedonia and along the Aegean. (Mil Mitt — Jun 1941)
Preparations for war, 1914-1939. (Mil Mitt — Jul 1941)
Monographs of the War on the Western Front. (Mil Rund — Mar, Jun 1941)
Concerning the strategic situation in the Mediterranean. (Mil Rund — Mar 1941)
The French defense against the German breakthrough across the Meuse between Sedan and Namur in May 1940. (Mil Rund — Jun 1941)
Italy in the present war. (Mil-Woch — 25 Apr 1941)
The theater of war in North Africa. (Mil-Woch — 25 Apr 1941)
The occupation of Denmark. (Mil-Woch — 9 May 1941)
The strategic significance of the Grecian railroad net. (Mil-Woch — 9 May 1941)
German soldiery. (Mil-Woch — 13, 27 Jun, 4, 25 Jul 1941)
Engineers in battle. (Mil-Woch — May-Jun, Jul-Aug 1941)
The assault on the Maginot Line. (Panzer — Apr 1941)
Battle experiences in the west. (Panzer — May 1941)
Reflections regarding the French campaign. (Rv Mil Suisse — Mar 1941)
Operations on the western front. (Rv Mil Suisse — Apr 1941)
Reflections on the campaign in France. (Rv Mil Suisse — May, Jun 1941)
Comments on the present war. (Rv Mil Suisse — May, Jun, Jul 1941)
Breakthrough action of a German tank regiment reinforced by motorized infantry on the Somme, 5-6 June 1940. (Rv Mil Suisse — Jul 1941)
R.A.F. operations in the western desert. (RAF Quar — Mar 1941)
R.A.F. operations in Greece from 7th November to 21st December, inclusive. (RAF Quar — Mar 1941)
The air war, 1940. (RAF Quar — Mar 1941)
Bombs on Germany. (RAF Quar — Mar 1941)
Notes on demolitions carried out in a large manufacturing town, after a recent air raid. (Roy Eng Jour — Jun 1941)
Divisional R.E. units equipment on active service. (Roy Eng Jour — Jun 1941)
The operations in Italian East Africa. (Tank — Mar 1941)
Development of the German panzer force. (Tank — Apr 1941)
With the B.E.F. in Flanders. (Tank — Apr 1941)
Tank lessons from Libya. (Tank — Apr 1941)
The conquest of Italian Somaliland. (Tank — Apr 1941)
The British campaign in Greece. (Tank — Jun 1941)
The panzer divisions. (Tank — Jun 1941)
The sea battle. (Tank — Jun 1941)
The operations in Crete. (Tank — Jul 1941)
The German war against encirclement. (Ws & Wr — Apr 1941)
War as viewed by French and British writers. (Ws & Wr — May 1941)
Grand strategy of World War II. (Fortune — Jul 1941)
The war with Nazi Germany: Climax in the Balkans. (Ill Lon News — 26 Apr, 17, 31 May, 7, 21, 28 Jun 1941)
Deciphering blitzed documents. (Ill Lon News — 26 Apr 1941)
A German panzer division moves into action. (Ill Lon News — 26 Apr 1941)
The first tank battle in history. (Ill Lon News — 17 May 1941)
The epic evacuation from Greece: dauntless British forces. (Ill Lon News — 31 May 1941)
Winged invaders of Crete. (Ill Lon News — 31 May 1941)
The link between army and air co-operation in action. (Ill Lon News — 21 Jun 1941)
The furious speed of modern warfare. (Ill Lon News — 28 Jun 1941)
The riddle of 1941. (Round Table — Jun 1941)
The strategy of the War. (Round Table — Jun 1941)
Yugoslavia — The tragedy of honour. (Round Table — Jun 1941)
America's gathering strength. (Round Table — Jun 1941)
Assault of fortified positions. [See page 12]
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New aspects of the war in the west. [See "Foreign Military Digests" section]
The shock troop engagement of the 111th Infantry against Bachy on 24 May. [See "Foreign Military Digests" section]
Artillery helps itself. [See "Foreign Military Digests" section]
The Sommauthe Woods battle of the 118th Infantry on 23 May. [See "Foreign Military Digests" section]
Airplanes supply tank ammunition. [See "Foreign Military Digests" section]
The German breakthrough into Greece. [See "Foreign Military Digests" section]
Tanks in a sand storm. [See "Foreign Military Digests" section]
Motorized infantry company attacks Calais. [See "Foreign Military Digests" section]
The battle of Crete. [See "Foreign Military Digests" section]
Cavalry reconnaissance detachment of the 46th Division in the drive against Blangy on 6 June. [See "Foreign Military Digests" section]
The formation of the bridgehead at Beaugency, 17-18 June, 1940. [See "Foreign Military Digests" section]
The tank battle near Le Vivier Danger. [See "Foreign Military Digests" section]
German advance guard in action — crossing the Seine. [See "Foreign Military Digests" section]
Operations of the "Greater Germany" infantry regiment south of Amiens, June 1940. [See "Foreign Military Digests" section]
The attack on Festieux by the 5th Company, 75th Infantry, and the march to the Aisne, 20 May 1940. [See "Foreign Military Digests" section]

WAVELL, General Sir Archibald Percival (1883-)

Wavell's Middle East command. (Inf Jour — Sep 1941)

WEAPONS

Our new medium tank. (A Ord — Jul-Aug 1941)
Railway artillery. An outmoded element of our seacoast defense? (A Ord — Jul-Aug 1941)
Ordnance on the march. (A Ord — Sep-Oct 1941)
Gages for guns. (A Ord — Sep-Oct 1941)
Weapons depend on gages. (A Ord — Sep-Oct 1941)
A new light rifle. (A Ord — Sep-Oct 1941)
Fighting equipment of army divisions. (A Ord — Sep-Oct 1941)
New Garand .30 caliber light rifle. (Cav Jour — Jul-Aug 1941)
War rockets of the past. (CA Jour — May-Jun 1941)
Wartime production. (FA Jour — Jun, Jul, Aug 1941)
An emplacement for the 75-mm. M2. (FA Jour — Jul 1941)
Armored attack south of A..... (FA Jour — Aug 1941)
Artillery and bombing planes. (FA Jour — Aug 1941)
Wartime production: steel and guns. (FA Jour — Aug 1941)
The fall of Belgium. (FA Jour — Aug 1941)
Fire power. (FA Jour — Aug 1941)
With the other arms and services: Ordnance. (FA Jour — Sep 1941)
The new medium tank. (Inf Jour — Jun 1941)
Weapons of German and British infantry battalions. (Inf Jour — Jul 1941)
Continuous tracking with the fifty-caliber. (Inf Jour — Aug 1941)
The 105-mm howitzer. (Inf Jour — Aug 1941)
Notes on German artillery organization and equipment. (Jour R Art — Apr 1941)
Marine Corps rifle tests: Springfield, Garand, Johnson, Winchester. (MC Gaz — Jun 1941)
Keep them firing. (MC Gaz — Jun 1941)
Important fundamentals in the construction of field guns. (Mil Mitt — Jun 1941)
How to install an automatic rifle for night shooting. (Rv Mil Suisse — Mar 1941)
A special manner of mounting our heavy machine guns. (Rv Mil Suisse — Mar 1941)
America bares its weapons of attack as the time for action draws nearer. (Life — 4 Aug 1941)
Assault of fortified positions. [See page 12]
Antimechanized defense. [See page 34]

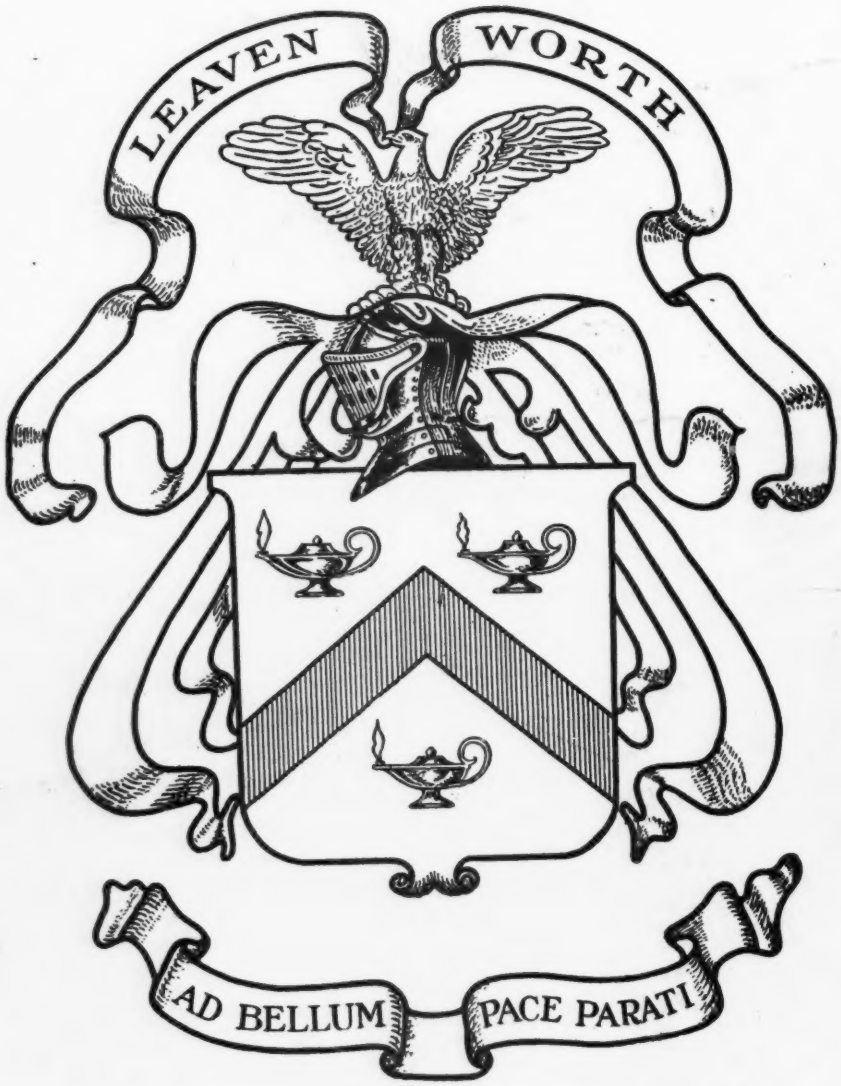
WEST INDIES

Around the bases: The West Indies. (Inf Jour — Sep 1941)

Y

YUGOSLAVIA (ARMY OF)

Yugoslavia — The tragedy of honour. (Round Table — Jun 1941)


LEAVEN WORTH
AD BELLUM PACE PARATI